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This product has been rated by the Entertainment Software Rating Board. For information about the ESRB rating, or to comment about the appropriateness of the rating, please contact the ESRB at 1-800-771-3772.

For more information about this and other Electronic Arts games, visit www.eagames.com.

WELCOME

Sub Command puts you in control of the most advanced submarines in the world, allowing you to play single missions or the campaign from either a Russian or U.S. vantage point. Multiplayer missions pit you against players commanding the most capable submarines at sea—whether you chose to drive the pride of the U.S. Navy's Submarine fleet or try your hand at commanding one of the finest Russian submarines.

As commanding officer, you can delegate Sonar, Radar, TMA (Target Motion Analysis) and Fire Control tasks to your auto crewmen or man all of the stations yourself.

Give orders to your crew via voice commands, use the handy menu commands from the Task Bar or mouse commands in the Navigation Station. The Task Bar allows you to change depth, speed and course from any of the ship's stations.

Create your own missions in *Sub Command*'s robust Mission Editor. Information from the United States Naval Institute is available for all military ships and planes used in the game.

CONTROLLABLE UNITED STATES SUBMARINES

SEAWOLF CLASS:

(SSN 21 class) This state-of-the-art U.S. attack submarine is the quietest nuclear powered submarine currently deployed by any country. With its superior stealth, a tactical speed higher than any other U.S. submarine, and its hardened sail, Seawolf stands ready to tackle missions as varied as the insertion of Special Forces to attacking Russian threats under the polar ice cap.

IMPROVED LOS ANGELES CLASS:

(688(I) class) The backbone of the fleet, "the 688(I) class sub is one of the quietest submarines in operation today and is armed with state-of-the-art weaponry. They are available in sufficient numbers to ensure availability for missions around the world. Import your favorite 688(I) Hunter/Killer missions for play in *Sub Command*. (See *Mission Editor/Importing Scenarios* on p. 162 of the manual.)

CONTROLLABLE RUSSIAN SUBMARINES

IMPROVED AKULA-I:

Russia's counterpart to the U.S. Los Angeles Class, the Improved Akula-I Class submarine is nearly as quiet as the 688(I). With six additional tubes external to the pressure hull, it is capable of carrying additional weapons or decoys.

AKULA-II:

The quietest nuclear powered Russian submarine in existence. At low speeds it is reported to be as quiet or quieter than the United States Improved Los Angeles class submarine. Also armed with six additional external tubes for weapons or countermeasures, the Akula-II is a formidable opponent.

MANUAL STRUCTURE – AN OVERVIEW

This manual is divided into 9 sections. These are briefly outlined below.

GAMEPLAY OVERVIEW

A brief overview of basic gameplay, an explanation of what is seen on the Navigation map and in the 3D View, as well as a brief description of all ship's stations.

MAIN MENU

Change your player identity, start single and training missions and the campaign, how to use the reference browser, a description of the players log, a brief description of options and information on how to end the game. Mission Editor and Multiplayer are covered separately later in this manual.

SHIP STATIONS

The inner workings of all ship stations for all controllable submarines. Basic information about the purpose of each station is followed by a description of how that station works on each of the three controllable subs. (The Interior stations of the Akula-I improved and the Akula-II are identical. See *Sonar Stations/Broadband Sonar* on p. 62.) Making use of your auto crewmen is also covered.

MULTIPLAYER

Step-by-step instructions for hosting or joining a multiplayer *Sub Command* game.

SPECIAL OPS AND PROCEDURES

Instructions for launching and recovering Special Forces and the DSRV, deploying UUVs, laying mines and operating under the ice.

MISSION EDITOR

In-depth instructions for using the Mission Editor to create and edit *Sub Command* Missions.

APPENDIX A

Glossary of Acronyms

APPENDIX B

Glossary of Terms

APPENDIX C

Tactics

GAMEPLAY OVERVIEW

As the Commanding Officer of a submarine, you use the ship's various sensors to detect other ships and subs. Once a contact is detected, you must establish the probable identity of the contact. Using the tools at your disposal, you can classify the contact to determine whether it is a neutral ship, an enemy ship or sub, a friendly contact or a pod of whales.

Your sub's sensors include a sophisticated Sonar Suite that utilizes both active and passive sonar, Radar, Electronic Support Measures (ESM) and the periscope. ESM, the Stadimeter, and Narrowband sonar help you classify contacts. Target Motion Analysis (TMA) helps you to determine the bearing and range to the contact, as well as its course and speed. This information is needed to calculate an accurate firing solution when it becomes necessary to target a contact with a torpedo or missile from Fire Control.

In every mission you are assigned at least one task considered critical and must be completed to ensure a satisfactory mission outcome. These are laid out in the mission brief and identified as Critical Goals in Mission Status and in Mission Debrief. Some tasks are secondary in importance. These are identified as non-critical goals.

As Commanding Officer you must complete assigned tasks while keeping your submarine quiet enough to avoid detection and have the skill to evade destruction if you are detected. You can man all stations yourself or, if desired, you can use the auto crewmen to assist you with detecting, classifying and targeting contacts, but bear in mind they are not infallible!

TERMS DEFINED

- In this manual 'click' always refers to a left mouse click. Right mouse clicks are designated as 'right-clicks'.



OK checkmark

- The words **OK** and **YES** refer to this checkmark.



Cancel circle

- **CANCEL** and **NO** refer to the 'Cancel' circle.
- For simplicity, the **Improved Akula-I** and the **Akula-II** submarines are referred to simply as **Akula** in this manual. Their interfaces are identical. Their capabilities are slightly different.
- A **contact** is anything detected visually or by one of your ship's sensors. A contact is sometimes referred to as a track. A contact, or track should not be confused with a *tracker*.
- A **tracker** is a device used to automatically follow an assigned sonar signal. When a tracker is assigned to a sonar contact, also called a track, periodic updates on the contact's bearing are sent to TMA. A tracker is not a track, but it 'tracks' a track.
- Each sub interface refers to designated contacts with slightly different words. In this manual any reference to an **alphanumeric designation**, a **Contact ID**, or a **Track ID** refers to designations assigned when a contact is detected. This is a letter with a number appended (e.g. S01, E01, R01, V01). Any reference to a Sierra number refers to a Sonar contact. M or Master contacts are Merged contacts.

NOTE: The keyboard commands described in this manual refer to the default settings shipped with the game. If you have changed your hot key assignments in the Options>Controls page, the keyboard commands listed here may not be accurate.

3D AND THE NAVIGATION MAP

You begin every mission at the Navigation Station (Nav). If you so desire, you can play much of the game from here. The Navigation Station contains a 2D map of the battle space as well as a retractable 3D window and a Data Display Indicator (DDI) that displays information about the selected contact. For a full description of the Navigation Station and how to play the game from that perspective, see *Ship Stations/Navigation Station* on p. 40.

WHAT YOU SEE ISN'T ALWAYS WHAT IS THERE!

For those who like to jump right in and begin playing, we offer a word of warning about the 2D and 3D views on the Nav map. What you see on the 2D map and 3D view and read in the DDI is only as accurate as your analysis of the available information and your classification skills.

NOTE: It is possible to view the actual location of some or all platforms and buildings in a mission by using the **Show Link Data**, **Show Dead Platforms** and **Show Truth** Game Options. Be aware that the directions and information in this manual assume these Game page options and all auto crew are OFF. For information on the options mentioned see *Main Menu/Options/Game* on page 29. If you selected **Novice** settings at installation some of the above options are enabled and the descriptions in this manual will not always match your game experience.



When you enter the game the symbol for Ownship, the sub you are commanding, is the only contact symbol that appears on the Nav map until one of your sensors detects a contact and you or your auto crew marks it. The exception to this is land targets. In some cases land targets appear on the Nav map as soon as the game starts. Land targets (as well as Link contacts) are marked with an alphanumeric designation that begins with the letter L. See *Main Menu/Options/Game/Show Link Data* on p. 30.

NOTE: If you have selected **Novice** option settings, you see the symbols for any friendly platforms in the area and your Sonar Auto Crewman begins reporting contacts. Selecting Novice settings enables the Show Link Data option.

Once the contact is marked or designated by one of your sensors, a symbol for the contact appears on the Nav map at the end of a line of bearing. You select a map symbol by clicking on it. (See *Navigation Station/2D Map/Contact Symbols* on p. 43.) When a contact is selected on the Nav map, a 3D object representing that contact appears in the 3D view. Until you classify the contact, only a large wire-frame bubble, or Area of Uncertainty, appears in the 3D view. The bubble extends above and below the water indicating that you have not yet classified it as a surface or subsurface

contact. Classification is explained in the *Ship Stations* chapter in the *Navigation Station*, *Narrowband Sonar* and *Periscope and Stadimeter* sections.) Once you give the contact a specific classification, the 3D object representing the specified class appears in the 3D window.

Beware! If you classify the contact incorrectly, what you see is not what is really there! For instance if you classify the contact as a cruise ship when it is actually a Russian Kirov class cruiser, the contact's symbol on the Nav map is the symbol for a neutral surface ship. When the symbol is selected, a model of a cruise ship is seen in the 3D window and the DDI reports the contact as a cruise ship.

Until a specific range is designated for a contact, the contact's symbol, usually the symbol for Unknown/Unknown (unknown platform type/unknown alliance), appears at the end of a line of bearing (LOB). The length of the LOB is a predetermined range and does not represent the actual range of the contact unless the contact is marked by Radar or Active Sonar. Since these sensors give a range as well as a bearing, the map symbol is placed at the end of a LOB at the range determined by the sensor.

Using TMA you can figure out the location of the contact with some degree of accuracy. In addition to the contact's location, you can also develop a firing solution, or simply a solution, which consists of your best assessment of the contact's bearing, range, speed and course. When you or your TMA Auto Crewman enters a solution for the contact from the TMA Station, the contact's symbol on the Nav map shifts to the location designated in your solution and begins to move on the course and at the speed designated in the solution. When you click the contact's symbol, all available information about the contact as classified or designated by you or your Sonar Auto Crewman appears in the Nav map's DDI.

NOTE: If you give the contact a generic classification, for instance Neutral Surface, and no specific class is assigned, a wire frame of a generic surface ship appears in the 3D view. A generic classification is assigned with the Contact menu's Designate Type/Alliance option. See *Ship Stations/Navigation Station/Contact Menu* on p. 45.

Again, be warned. What appears in 2D, 3D and the DDI is only as accurate as you are!

3D VIEW IN A SUB GAME?

Modern submariners do not yet have the luxury of windows. The only view submariners have of their physical surroundings is from the bridge or through the periscope. They must rely totally on their sonar sensors when below periscope depth. We understand that for many players the idea of 3D in a submarine game is at best a huge cheat. For that reason, 3D can be turned off in the Options>3D page and can be disabled by the host in a multiplayer game. This prohibits all players from viewing 3D in that game. See *Main Menu/Options/3D* on p. 30 and *Multiplayer/Multiplayer Options* on p. 157.

The 3D view is on by default in *Sub Command* and is visible in a retractable window on the Navigation map. For those of you who enjoy watching the results of your efforts in a 3D environment, the option is there. But be reminded that what you see in the 3D view may not be what is actually there! (See above.)

OVERVIEW OF SHIP STATIONS

All controllable submarines have the same stations. While each class has a different look and feel, the functionality of the stations is basically the same. What follows here is a brief description of the ship stations available in *Sub Command*. For detailed information on how to use each station, see the *Ship Stations* beginning on p. 34.

TASK BAR

The Task Bar is available at the bottom of all ship stations and provides a pop-up Stations Menu for switching to other ship stations and a pop-up Orders Menu for issuing common ship commands. In the Task Bar, you can also change depth, course and speed, and see a history of crew reports, radio messages and multiplayer chat messages.

NAVIGATION

You begin the game at the Navigation Station. It is here that you see a map of the battle space (The Nav Map). (You must scroll to see the entire space.) Once a contact is detected it appears as a symbol on the Nav map. You designate a contact's classification from the Nav map using the contact's right-click menu (Contact menu) although you must determine the correct classification from the Narrowband, ESM or the Periscope/Stadimeter stations. The Navigation screen also contains the 3D window for viewing selected contacts, and known information on selected contacts is available in the Data Display Indicator (DDI) area of the screen.

Using a combination of auto crew, the Task Bar, and voice and mouse menu commands it is possible to play much of the game from the Nav Screen. Information on playing the game from the Nav Station and using Voice Commands is found in this section.

SHIP CONTROL

In Ship Control you change and view the actual as well as the ordered depth, course and speed of your sub. The towed arrays are deployed in Ship Control and it is from here that you conduct an emergency blow, rig in the bow planes, ventilate, charge air banks and open and close the main ballast tanks. The trim display is also located in Ship Control. (You can change your course, speed and depth from any station using the Task Bar, Ownship menu and voice commands.)

SONAR: BROADBAND

Broadband is the default sonar function. It is used to detect and track broadband frequency noise emanated from surface ships and submarines. Biologics such as whales and shrimp can also be detected in broadband.

SONAR: NARROWBAND

The Narrowband function is used to detect and track narrowband frequency noise emanated from surface ships and submarines. The Narrowband Station is also used to classify contacts. The sound signature of a selected contact is compared to a library of known sound signatures. Only sources with similar signatures are presented to help determine the most likely sound source.

SONAR: DEMON

DEMON is an acronym for Demodulated Noise (DEMON). The DEMON Station is used to determine the contact's speed. Here you can also determine the number of blades on the contact's propeller, which can help you classify the contact.

SONAR: ACTIVE

In Active Sonar, a ping or a series of pings is transmitted. The resulting echoes from an object are used to determine that object's bearing and range.

SONAR: ACTIVE INTERCEPT

The Active Intercept Display provides information on an entity that is transmitting active sonar pings. It gives information on the transmitting entity's bearing, the interval between pings, the age of the last signal, and the signal strength. Knowing the signal strength might also assist you in determining the relative proximity of the active sonar source.

SONAR: SSP

The Sound Speed Profile (SSP) displays the speed at which sound is transmitted at various depths in the ocean at your current location. Water tends to form distinct layers of density. These layers affect sonar transmissions. Knowing the location of the layer in your area is important since the layer can affect your ability to detect enemy ships and subs and also helps you hide from them.

TMA

The Target Motion Analysis (TMA) function works in conjunction with the ship's four major sensors. Using inputs from sonar, radar, ESM and periscope, TMA helps you determine a contact's bearing, range, speed and course. This information is necessary for developing a target solution.

FIRE CONTROL: TARGET DISPLAY

The functions available on the Fire Control Stations vary from class to class. These differences are covered in the Ship Stations section of this manual. In general the Target Display panel is used to designate the contact you want to target and select the tube and weapon with which you want to attack the target. The weapon's track can also be viewed on a map and certain weapons can be wire-guided, enabled or shut down from this station.

FIRE CONTROL: LAUNCH PANEL

From the Launch Panel the selected tube is flooded, pressure is equalized and the muzzle door is opened in preparation for the launch of the weapon. Depending on the class of submarine you are commanding, you may also enter weapon presets or launch countermeasures from this station.

FIRE CONTROL: COUNTERMEASURE LAUNCHER (SEAWOLF ONLY)

From here the countermeasure tube and the type of countermeasure to deploy is selected and launched. If you are commanding a 688(I) or an Akula there is no separate station for countermeasures. Countermeasures are launched from the Launch Panel.

FIRE CONTROL: WEAPON STORES

From here you can view the inventory of the weapons still available in your racks and those currently loaded in your tubes.

RADAR

Radar uses high frequency radio waves that are transmitted from the ship and reflected off objects to determine bearing and range. Bearing and range data, once appropriately marked, is then sent to the TMA Station and Navigation map for analysis. Use the radar to detect surface contacts, land, and low-flying objects.

RADIO / ESM

The Radio is your submarine's link with the outside world. Messages may be received at any point in the mission and can include additional tasking or key intelligence updates. It is important to come to periscope depth and raise the radio antenna or deploy the wire at regular intervals during your mission.

The Electronic Support Measures (ESM) system is also available at this station. This passive system detects electromagnetic transmissions from other ships when the ESM mast is raised above the surface of the water. In addition to detecting the direction and signal level of radar transmissions from other ships, ESM also compares these signals to a database and identifies the source of the transmission.

PERISCOPE / STADIMETER

With the periscope you can detect and track contacts visually. You can also photograph a contact through the periscope for use in classifying the contact and determining its range and course with the Stadimeter. The Stadimeter can only be reached from the Periscope Station.

The Stadimeter accesses a library of known surface platforms and allows you to match the photos you take through the periscope with one in the library. With the exception of the contact's speed, all information necessary for an accurate firing solution can be determined with the Stadimeter.

UNDER ICE DISPLAY

In addition to High Frequency Active sonar, which is useful for locating mines and for avoiding ice, ships also carry equipment especially designed to assist with locating variations in ice thickness. This is important when searching for an area that is safe to surface when under ice. The use of the Under Ice Displays to locate polynyas is discussed here. Directions for surfacing under the ice are found in *Special Operations and Procedures/Under Ice Operations* on p. 152.

AUTO CREW ASSISTANCE

If you are a newcomer to submarine warfare you may want to turn on your auto crewmen to assist you as you learn the inner workings of the ship's stations. Even if you are an experienced player, when the action is hot and heavy you may want to activate one or two of the crew to assist you with some of the more difficult tasks. Auto crewmen are available for Sonar (he handles both Narrowband and Broadband), TMA, Fire Control and Radar. But remember, like humans, your auto crewmen are not perfect!

Auto crewmen are enabled in the Options menu (select Options>Crew) and by clicking on the label of the station for which an Auto Crewman is available. The label changes to inform you that the auto crewman is on duty. When an auto crew setting is available for a station, the cursor changes to a finger when over the station's label. For specific information on individual Auto Crewmen, see *Ship Stations/Auto Crewmen* on p. 146.

NOTE: If you selected Novice settings when you installed the game or from the Options>Crew page all auto crew are on by default.

MISSION STATUS

As you progress through the mission you can check the status of your goals and tasking at any point. The Mission Status screen provides your current score (in Single Missions only), the status of both critical and non-critical goals as well as a list of all platforms you have killed so far.

- Press **[ESC]** then click **Mission Status** from the System menu.
- Click **OK** to return to the mission.

Sub Command Tip: Before ending a mission, visit the Mission Status screen to ensure you completed all of your critical and non-critical goals.

ENDING A MISSION

There are four ways to end a mission and enter Mission Debrief. Two ways offer you the opportunity to save your mission before exiting to Debrief.

To save a mission and exit to Debrief:

- Press **[ESC]** then click **SAVE AND EXIT** on the System menu. The System menu can also be selected from the Nav Map menu. (Right-click the Nav map to access the Nav Map menu.)
- Press **[CONTROL] + [SHIFT] + [S]** to display the Save dialog. When you exit the Save Dialog, you enter Mission Debrief.

To exit directly to Debrief:

- Press **[ESC]** then click **EXIT** on the System menu.
- Press **[Q]**.

NOTE: You can save the game at any point during gameplay without exiting by selecting **[CONTROL] + [S]**.

MISSION DEBRIEF

Two options are available in Mission Debrief: Status and Replay. By default Status information is displayed.

- Click **REPLAY** at the left of the screen to display the Replay screen.
- Click **STATUS** to return to the Mission Status information.
- Click **OK** to exit to the Main menu.

STATUS SCREEN

This screen displays the same status information that was visible in the Mission Status screen during gameplay. This information is also available in the Player's Log after each mission. The final score for the mission as well as a list of goals and the final status of each is available along with the list of all platforms and buildings you destroyed during the mission.

REPLAY SCREEN

To view a replay of the mission just completed, click. A view of the battle space appears along with a set of controls. These work like VCR or tape recorder controls.

- Press **[SHIFT] + [G]** to toggle the display of names on the Replay map.

MAIN MENU

From Sub Command's Main menu you can:

- set your player name.
- select single, campaign or multiplayer missions.
- access the Mission Editor to create or edit your own scenarios.
- view U.S. Naval Institute data on the ships and weapons available in *Sub Command*.
- access the game's options. In Options you adjust game, sound and 3D settings, and view or reassign hot key designations, and set multiplayer options.

From the main menu you can also view the record of your current game persona in the Player's Log.



CHOOSE PLAYER NAME

To choose a player name:

1. Following the opening video, the Main menu appears.
2. Enter your Captain's name in the Edit box at the upper right of the screen. Previously created Captain names appear in the drop-down list. If you have already created a name, click that name in the list. Your Captain's careers are automatically tracked by the game. See *Player's Log* on p. 28.
3. After you create or choose a player name for the mission, select the Main menu item you wish to access.

MISSIONS

Clicking on Missions in the Main menu takes you to the Missions screen. From here you select the type of mission you want to play, Training, Single or Saved and select a specific mission title. Single missions are shown by default. A brief description of the selected mission is available in the Mission Description window.

You must also select a submarine to command in the mission. This is done from the Submarine Selection window in the upper right corner. The submarines that are available to command differ from mission to mission so you must select the mission first. A tasking overview for the selected controllable submarine is seen in the Tasking Window. Tasking may be different depending on the submarine selected. Some missions have only one submarine available to command some have more. The submarine selection process is explained below.



The Submarine Selection Window

The Submarine Selection Window contains a graphic of the selected submarine class and two drop-down lists. The upper drop-down list is called the Controllable Sub Selector. The lower drop-down is the Specific Sub Selector.



All missions have at least one controllable sub. If the mission designer has added more than one controllable sub to a mission each controllable sub is numbered and can be selected in the Controllable Sub Selector.

Some Controllable Subs offer the player a choice of submarine to command for a specific task. The options are explained below.

Controllable Sub Selector:

When a mission is selected you may see one, both or several each of the following options in the Controllable Sub Selector drop-down list:

CONTROLLABLE SUB:

When **Controllable Sub** (no leading asterisk) is selected in the Controllable Sub Selector only one submarine is available to command. That sub name is the only one listed in the Specific Sub Selector. The tasking overview for this specific sub appears in the tasking window. There may be more than one Controllable Sub in a mission. Each controllable sub within a mission may be assigned different tasking.

*CONTROLLABLE SUB:

When ***Controllable Sub** (with a leading asterisk) is selected the in the Controllable Sub Selector the Specific Sub Selector is enabled and the player can choose to command any submarine in the list. All of *Sub Command*'s controllable subs appear in the Specific Sub Selector list regardless of country. One sub name appears as default as designated by the mission designer.

NOTE: Missions with more than one controllable sub can be played as Multiplayer Missions. The number of controllable subs in a mission determines the number of players that can play that mission. A number appears in front of Mission titles in the Multiplayer Missions screen indicating the number of controllable subs in each mission.

Specific Sub Selector

The submarine name that appears in the Specific Sub Selector when you click **OK** is the submarine you command in the mission. When the Specific Sub Selector is enabled you can choose any submarine in the list. The tasking overview that appears in the Tasking Window applies to the sub selected.

TRAINING MISSIONS

To gain an understanding of how to use the most important ship stations and functionality in *Sub Command*, it is recommended you try the training missions before proceeding to the single missions or campaigns.

NOTE: The Training missions cover the Seawolf interface only. The other sub interfaces function similarly. Differences between the interfaces are covered in the Ship Stations chapter of this manual.

Training Mission 1: Covers the basic game interface and maneuvering procedures from the Task Bar and Ship Control.

Training Mission 2: Covers basic sonar operations.

Training Mission 3: Covers Target Motion Analysis (TMA) and targeting and launching weapons from Fire Control.

A description of a training mission can be viewed when you select its title in the Mission Title Selection List.

NOTE: Music, Sound effects, crew responses and all Auto Crew are disabled in Training Missions.

To begin a Training Mission:

- The steps for beginning a Training Mission are the same as those for starting a single mission except you must select Training at the left of the Missions screen and that you can only select a Seawolf submarine to drive from the Specific Sub Selector. The steps for starting a mission are listed in the Single Missions section below.

SINGLE MISSIONS

To begin a single mission:

1. In the Missions screen click **SINGLE**. Single Mission names appear in the Mission Title Selection List. Stars next to the mission name denote level of difficulty, from one star (easy) to four stars (most difficult).

2. Click the mission title of your choice. A description of the selected mission appears in the Mission Description window and a map of the battlespace appears in the Mission Location window. The tasking overview for the default controllable sub appears in the Tasking window. (Alternate tasking may be assigned to other controllable subs when they are available in a mission.)
3. Select an option from the Controllable Sub Selector drop-down. The drop-down contains the list of Controllable Subs available in the selected mission. If the drop-down is grayed out, only one controllable sub is available in the mission. See *Submarine Selection Window* on p. 21.
4. If the Sub Specific Selector is enabled you can chose to command any sub in the list otherwise the sub shown is the only sub available.
5. To see another available mission, select a different mission title.
6. Click **CANCEL** to return to the Main menu.
7. Click **OK** if you want to play the selected mission. The Mission Brief screen appears and displays complete tasking information.

SAVED MISSIONS

Single missions you save are accessed from the Saved menu on the Mission screen.

1. Click **SAVED** to display the names of all saved Single missions in the Mission Selection window.
2. Steps for loading a Saved mission are as follows:
 - From the Missions screen, click **SAVED**. A list of Saved Games (if any have been saved) appears.
 - Click on the mission you wish to continue, then click **OK** to load it.

MISSION BRIEF

The Mission Brief screen provides the complete tasking brief and an opportunity to change your weapon loadout.

1. Click **WEAPON LOADOUT** at the bottom of the Mission Brief screen to review or alter your ship's loadout to better suit your mission needs. See *Weapon Loadout* below.
2. Click **OK** to begin the mission, or click **CANCEL** to return to the Mission Selection screen.



WEAPON LOADOUT

Depending on your mission tasking you may need to alter your default loadout. If you are tasked to hunt down and destroy an enemy submarine, you don't want your tubes full of land attack missiles and your racks full of anti-ship missiles. The time to change your loadout is before you get underway. From the Weapons Loadout screen you can change the weapons loaded in the tubes, change the number and type of stored weapons, and adjust the loadout of your countermeasures.



The weapons available for each sub class vary but the method for changing the loadout is basically the same in each controllable submarine. The 688(l) class has an additional loadout screen to accommodate the vertical launch tubes and the Akula classes have an extra screen for their external tubes.

Whenever an item is selected in the drop-down list information about the selected item appears in the information window.

To change the loadout in torpedo and VLS tubes:

1. In the Mission Brief screen click **WEAPON LOADOUT**. The Tubes loadout screen appears. The current loadout is represented by numbered, colored dots on a wire frame representation of the ship's hull. The numbers represent the tube number. The name of the weapon loaded in each tube is seen in the drop-down list associated with each tube number. The color of a dot on the wire frame coincides with the color assigned to represent each specific weapon.
2. Click the arrow in a weapon drop-down list associated with a specific tube and select a different weapon from the list to change the weapon loaded in that tube.
3. Change loadout in Stores or CMs (countermeasures) before clicking **OK**.
 - In the 688(l) class, click **VLS** to alter the loadout in the ship's Vertical Launch System (VLS) tubes. Changes are made as described above.
 - In the Akula Classes, click **INNER TUBES** to change the loadout in the ship's internal tubes. Click **OUTER TUBES** to change the loadout in the six tubes that are external to the pressure hull. Changes are made as described in the steps above.
4. Click **OK** to implement all of your changes and return to the Mission Brief screen.
5. Click **CANCEL** to ignore any changes you make on any of the screens and return to the Mission Brief screen.

To change the number and type of weapons stowed:

1. Click **STORES**. A screen showing the type of weapons that can be carried on your sub is displayed along with the number of weapons for each type currently stowed in the racks and in the tubes. Only rack stowed weapons can be changed on the Stores screen.
2. Click the right or left facing arrows associated with each weapon type to increase or decrease the number of that weapon stowed.
3. At the bottom of the Rack Stowed column a tally showing the number of weapons currently stowed is followed by the total number of weapons it is possible to stow on your submarine. For example if you are commanding a Seawolf class sub the numbers 48/52 means that there are currently 48 weapons stowed and it is possible to stow 52. You can add four more weapons before you reach your maximum.
4. Make the desired changes to all loadout screens before clicking **OK**.
 - Click **OK** to implement your changes and return to the Mission Brief screen.
 - Click **CANCEL** to ignore any changes you made on any of the screens and return to the Mission Brief screen.

To change the countermeasure loadout:

1. Click **CMS** at the left of the screen. A screen displaying the current countermeasure loadout is seen. The number of internal and external countermeasure tubes may vary depending on which sub class you are commanding.
2. Click the arrow in a countermeasure drop-down list associated with a specific countermeasure tube and select a different type of countermeasure from the list to change the countermeasure loaded in that tube.
3. Make the desired changes to all loadout screens before clicking **OK**.
 - Click **OK** to implement your changes and return to the Mission Brief screen.
 - Click **CANCEL** to ignore any changes on any of the screens and return to the Mission Brief screen.

NOTE: The changed loadout is attached to your player name and becomes your sub's default loadout for all subsequent missions you play with that player name.

CAMPAIGN

Click the Campaign button to access the Campaign Selection Screen. From here you choose a side, select the submarine to command and go head to head with the best the enemy has to offer in the selected campaign mission.

THE STAGE WAS SET

The Russian Defense Minister: *"A nuclear submarine fleet is the future of the armed forces. The number of tanks and guns will be reduced, as well as the infantry, but a modern navy is a totally different thing."*

CNO CONGRESSIONAL TESTIMONY: House National Security Committee Testimony, 1996 Defense budget, February 22, 1995:

"... The Russians today have six submarines at sea that are quieter than the 688(l)s, our best submarine. ... This is the first time since we put Nautilus to sea that they have had submarines at sea quieter than ours. As you know, quieting is everything in submarine warfare."

But even as these words were spoken, the Soviet era had given way, and the submarine warriors had a few years to rest on their laurels.

RUSSIA RESURGENT

A new government has come to power in Russia with a promise of restoring the country to international prominence as a world superpower. Military units are being rebuilt through increased training, mass production of existing weapons, and research and development to provide new capabilities.

The leading edge of this activity is the Russian submarine force, which has suffered the least decline since the end of the cold war. Submarines are engaged in operations to gain intelligence about U.S. forces and to ensure U.S. submarines are not able to observe Russian exercises. The Russians are especially keen to enshroud the development of a new anti-air warfare missile.

The U.S. leadership in the Department of Defense, the State Department and the intelligence agencies has initiated actions to monitor Russian capabilities and determine their intentions. Submarines are critical assets for covertly gaining the required information.

Peacetime Rules of Engagement are still in force but as the Russians increase preparations, the encounters between the two countries become more frequent and the possibility of hostilities intensifies. The risk of an undeclared war beneath the surface increases with every encounter.

To combat the new capabilities of the Russian Improved Akula-I and Akula-II submarines, the U.S. fleet commissioned the Seawolf class submarine in the late 90s. While quieter and more capable than any nuclear submarine at sea, construction of the class was canceled for all but three vessels. Only two Seawolf class submarines are currently deployed. The 688(I) class remains the backbone of the U.S. submarine fleet.

Tensions are rising, and the premier submarines of the two navies must be the first instruments of national policy. However, a submarine is merely an extension of the wit, creativity and will to win of the Commanding Officer. If you have the skill, knowledge and character to command the world's elite submarines, step up to the challenge of Sub Command.

CAMPAIGN ORGANIZATION

The campaign is divided into fourteen missions. You can elect to play all thirteen missions of the campaign as the commander of a Russian Akula class, a U.S. 688(I) or Seawolf class submarine. With minor exceptions (noted in the descriptions), the same missions are present in all three campaigns; only your perspective and goals and the capabilities of the submarine you command are changed. In each mission, one submarine has an offensive role and the other has a defensive role. The opposing force may have several submarines, but you have no friendly submarines. Regardless of the ship chosen, you have the same required missions, although the order is somewhat different.

In *Sub Command*, failure to achieve specific goals need not result in the necessity to replay the mission. There will, however, be mission-relevant consequences in future missions depending on whether or not you complete important goals as you go along.

The early missions require support of naval exercises in home waters and missions in enemy coastal waters for observation of enemy naval operations and insertion of Special Forces. Both submarine forces focus on an upcoming test of the new Russian anti-air missile in the early missions. If the Russians can deny U.S. forces' knowledge of the characteristics of this weapon, then the Russian Northern Fleet will be much more effective when the battle is eventually joined.



To begin the Campaign:

1. From the Main menu, click **CAMPAIGN**. The Campaign screen appears.
2. In the Campaign Selection Window click the name of the sub class you want to command for the campaign: **Seawolf**, **688(I)** or **Akula**. Mission names appear in the Mission Selection window.
- To view saved campaign missions click **Saved Missions**. A list of saved campaign missions appears in the Mission Selection window.
3. Select the first (or next available) mission in Mission Selection window. A description appears in the Mission Description window. A tasking overview appears in the Tasking window.
4. In each Campaign only one sub is available to pilot. Your sub's name is listed in the Specific Sub Selection window.

Note: To proceed to the next mission, you must successfully complete all the mission's critical goals. Critical and non-critical goals are listed in the Mission Status screen during gameplay. Press **[F10]** during gameplay to access the Mission Status screen or select Mission Status from the System menu.

5. Click **OK** to receive the Mission Briefing or click **CANCEL** to return to the Main menu.
6. The Mission Briefing is several pages long. Press **[PAGE DOWN]** (default hot key) to move to the next page.
7. At the completion of the briefing the Mission Brief screen appears listing your tasking and offering you a chance to change your weapon loadout.
8. Click **OK** to start the mission or click **CANCEL** to return to the Campaign screen.

MULTIPLAYER

Up to eight players can link up via Internet or a local network to create alliances and engage in combat against human opponents or computer AI. For in-depth information, see *Multiplayer* on p.153.

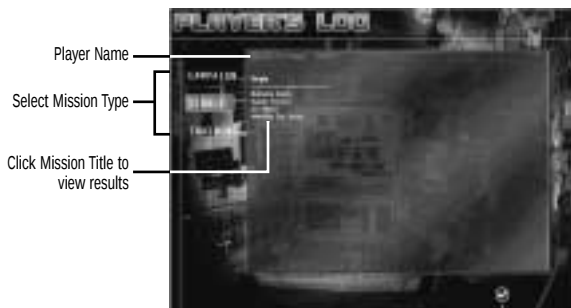
Online gameplay for *Sub Command* will be available only through August 31, 2002 subject to online terms of use and all features may not be available at the time of purchase. Please check online at www.ea.com for more information and terms of use.

MISSION EDITOR

Custom build single or multiplayer missions anywhere in the world. Make your missions as simple or complex as you desire and include random events, groups and opponents so that the game plays differently each time it is played. You can place one controllable submarine or several in your scenario and play the game from different perspectives. Opponents and allies can be created from the navies of sixteen different countries. For in-depth information, see *Mission Editor* on p. 161.

PLAYER'S LOG

Sub Command maintains a log for all player names you create. The log displays every mission attempted by your current player name and the results of each are displayed when you select the name of a specific mission.



Missions are grouped by category.

1. At the left of the screen click the desired text to select the type of missions you want to view. A list of all mission titles of that type undertaken by your current persona is displayed. It may be necessary to scroll down to see all mission titles. Multiplayer mission results are viewed with the Single mission results.
2. Click a mission's title to see the results of that mission. The information displayed is the same as that displayed on the Mission Debrief screen at the conclusion of that mission. Slightly different information appears depending on the Mission Type.
3. **BACK TO GAME LISTING** at the bottom of the mission information to return to the list of missions. You may need to scroll to view this text.
4. Click **OK** to return to the Main menu.

OPTIONS

Selecting Options from the Main menu displays the Options menu. The Game Options page displays by default. The text buttons at the left of the screen indicate the type of options that are available. Click the name of the Options page you wish to view. A green box around the text button indicates the selected options page.



A check mark in a box associated with an option indicates the option is **ON**.

GAME: Set Game and map control options. The following options are available:

Show Dead Platforms: When ON, all platforms that are 100% destroyed display in their actual locations on the Nav map and their actual identity is displayed in 3D View. Should the contact be killed by a platform other than Ownship, the contact symbol displays on the Nav map whether you have detected it or not.

If you have detected the contact, the contact's symbol remains on the map moving at the course and speed designated in the TMA solution even after the actual ship or object is destroyed. This can result in seeing two symbols and two 3D models for the same contact when this option is on.

For example, assume you have a contact designated S01. You have a TMA solution on S01 that places it on bearing 235 at a range of 4000 yds but the contact is actually on bearing 239 at a range of 5000 yds. Additionally, you have classified S01 as a Krivak class frigate when it is actually a fishing boat. When you click S01 on the Nav map the 3D model of a Krivak appears in 3D view.

Now suppose that you fire a torpedo at S01 using your TMA solution. Because your solution is close to the actual location of the contact the torpedo picks up the actual contact and destroys it. If you are attached to the torpedo you will see it go right through your TMA solution in 3D because it is not in the actual location of the contact. The torpedo proceeds on to the actual location of the contact and kills it. A symbol for the contact immediately appears at the actual location of the platform on the Nav map and the model of the dead fishing boat appears in the 3D View if you select the symbol. Your S01 solution symbol and the Krivak model remain on the map until you go to the TMA station, select S01 and drop it.

If Show Dead Platforms is OFF, you never see in 3D what you have killed. Based on the sound of explosions and the loss of a signal on a given bearing you may assume that you have killed something. If you want to know for sure what you have killed without turning on this feature, go to the Mission Status screen and scroll down to the *Kills* section.

Show Truth: When ON, symbols for all objects in the mission display on the Nav map whether you have detected them or not. When a 'truth' contact is selected on the map accurate information

about the contact is seen in the Data Display Indicator and in the 3D view. The information in the DDI has a different format than that seen when Show Truth is OFF.

When ON no Contact IDs are seen in the TMA or Fire Control Drop-down lists. You can only engage Truth contacts from the Nav map using the Contact menu's Engage With command or by shooting a Snapshot at the contact from the Fire Control Target Display.

Truth is OFF by default and must be enabled here or by using the keyboard command or the Nav Map menu. The default keyboard command is shown.

- Press **[CONTROL] + [SHIFT] + [T]** to toggle the display of truth on the Navigation Map.
- From the Nav Map menu select Layers>Show Truth. Select Layers>Hide Truth to turn truth OFF again.

NOTE: A host in a multiplayer game can turn OFF the Show Truth capability so no players in the game can use it.

Show Link Data: When ON, friendly or allied contacts appear on the map as blue symbols of the correct platform type. Since this information is provided from your link to other ships and satellites, they are designated as Link reports and have an **L** designation on the Nav and Fire Control maps.

Clicking on an **L** contact on the map displays information in the DDI, in the 3D view and the location of the platform that is accurate as of the last Link report. Link data is reported on a time delay so the locations may not be exact but they are the locations with a high level of confidence. Link information is updated on the map as long as the option is ON.

If the Show Link Data option is ON when you leave a mission, it is also ON at the start of the next mission.

This option can also be set as follows:

- Press **[SHIFT] + [CONTROL] + [A]** to toggle the display of Link Data for allied platforms and land sites.
- From the Nav Map menu select Layers>Show/Hide Link Data.

NOTE: L contacts do not display in the TMA **Select** drop-down list. Some land sites are designated during mission design as Auto Detect. A land site so designated is always visible and also has an **L** designation. It remains visible even if Hide Link Data is selected. **L** and **L** contacts do appear in the Fire Control Target list.

Fire Control Quick Launch: When ON the time it takes to unload and load weapons and countermeasures is reduced as follows:

- Weapon unload/load time drops from 16 – 18 minutes (depending on the sub) to approximately 35 seconds.
- Weapon load time drops from 8 – 9 minutes (depending on the sub) to 20 seconds.
- Countermeasure unload/load time drops from nearly 6 minutes to 14 seconds.
- Countermeasure load time drops from 3 minutes to 8 seconds.

Enable Tool Tips: When ON the name of the screen, button name or function and in some cases additional information displays when the cursor is held over game labels, buttons and entry fields.

3D: Set screen resolution and 3D effects and testing options. Select Disable 3D to completely disable 3D in a mission.

CREW: Activate or deactivate Auto Crewmen. When ON, Auto Crewmen perform specific game tasks as follows:

Radar Auto Crew: When ON, Radar Auto Crewman marks and updates all Radar contacts as long as the Radar is on.

TMA Auto Crew: When ON, TMA Auto Crewman merges contacts, performs TMA assessment, and enters Firing Solutions for all designated contacts.

NOTE: When the TMA Auto Crewman is ON you cannot adjust solutions at the TMA Station. If you attempt to move the TMA Ruler or make entries in the Trial Solution Fields, your TMA Auto Crewman moves them back to the settings he entered.

Sonar Auto Crew: When ON, the Sonar Auto Crewman marks contacts in Narrowband sonar and assigns trackers. (Trackers appear in both Narrowband and Broadband Displays). He then commences classifying the contact in Narrowband. Once classified the contact's symbol on the Nav map changes shape to reflect the classification determined by the Sonar Auto Crewman. You must still assign an alliance to the contact from the Contact menu's Designate Type/Alliance>Alliance option. See *Ship Station/Navigation Station/Contact Menu* on p. 45.

NOTE: When Sonar Auto Crewman is ON you can still assign trackers and mark contacts. In some cases you may be quicker than he is. You can also move the Narrowband Cursor to designate the search area for the **Sonar Auto Crewman**.

Fire Control Auto Crew: When ON, the Fire Control Auto Crewman enters presets appropriate for the contact.

NOTE: Be aware that if you designate a contact as a surface ship when it is really a submarine, the Fire Control Auto Crewman enters presets appropriate for a surface ship. He uses your classification and the existing TMA firing solution to determine appropriate presets, even if your classification and firing solution are wrong.

For more detailed information on Auto Crew functionality, see *Ship Stations/Auto Crewmen* on p. 146.

- Setting Novice Defaults turns ON all Auto Crew options.
- Setting Advanced Defaults turns OFF all Auto Crew options.

SOUND: Enable voice commands as well as in-game sound and music options. A list of available English voice commands is found in *VoiceCommands.doc* located on the *Sub Command* CD.

CONTROLS: Displays hot key assignments for the 2D Map, 3D View and General game functions. Hot key assignments can be changed here. See *Options/Changing Hot Key Assignments* below.

MULTIPLAYER: These options are only available to the host in a multiplayer game. Options you set here are enabled when you host a Multiplayer game. If you join a Multiplayer game any options you set here are disabled. When you host you can also set these options from the Game Room. See *Multiplayer/Multiplayer Options* on p. 157.

CHANGING HOT KEY ASSIGNMENTS

To change hot key assignments from the Options>Controls pages:

1. Double-click the text of the option you want to change. The option is highlighted and the text changes color.
2. Press the desired new key or key combination. An alert message appears if that key or key combination is already assigned to another command and displays the name of the command currently assigned the key(s) you pressed.
 - Click **YES** to swap the two key assignments.
 - Click **NO** to maintain the current hot key settings.
3. Click **OK** at the bottom of the Options menu to accept all changes or click **CANCEL** to ignore all changes and retain your previous settings.

SAVING OPTIONS CHANGES AND RESTORING DEFAULTS

To save options changes:

- Click **OK** to apply all changes made on any page. The Options menu closes.

To exit the Options menu without enabling any changes:

- Click **CANCEL**. The Options menu closes.

To set setting to the default options:

1. Click **DEFAULTS** on each page to set that type of options to the default settings shipped with the game. Each option type has a separate Defaults button. Some Options have Novice and Advanced Settings. See Novice and Advanced Defaults below.
2. There are three pages of Controls options. Click the check box at the top of the screen to select that page of Control options. Clicking Defaults on any of those three pages resets the default options on all three pages.

NOVICE AND ADVANCED DEFAULTS

Some types of options are turned on or off at game startup depending on whether you selected Novice or Advanced settings during game installation.

- To switch from one setting to the other or to restore the original settings if you have altered them select Novice Defaults or Advanced Defaults as desired from each page that contains those options.
- If a page has only one Defaults button, the default options are the same for both novice and advanced players.

NOTE: This manual assumes **Advanced Defaults** are selected. If you have selected Novice settings, your game experience is slightly different than described in this manual. For information on the settings enabled for the Novice player, read about Game and Crew Options above and see *Ship Stations/Navigation/Playing From The Nav Station* on p. 50.

- **Advanced Defaults** turns OFF all Game page options except Enable Tool Tips. No Crew options are enabled.
- **Novice Defaults** turns ON these Game page options: Show Link Data, Show Dead Platforms, and Fire Control Quick Launch. All Crew Options are enabled.

USNI REFERENCE

Data from the U.S. Naval Institute (USNI) was used as the reference for the information in the online USNI browser, and for the performance parameters used in the game databases. Any deviations from USNI data for gameplay purposes are annotated in the browser entries.

USING THE BROWSER

To access Reference Information from the Main menu:

1. Click **USNI REFERENCE** on the Main menu. The Information Browser opens.
2. Click the desired nation and platform name or the desired weapon type and the weapon name about which you want to learn more. The browser shows the text entry by default.
3. Click **TEXT**, **PHOTO** or **3D** at the left to view the designated type of entry.
4. Press  to page through the text, photo or 3D entries of a given type for the selected country or weapon type.

To manipulate the 3D object in the browser:

- Press SPACEBAR or any arrow key to stop the rotation of the 3D object.
 - Press **[S]** to start the object rotating again.
 - **[CONTROL]** + **[+]**: Zooms in on the selected object or last camera position if nothing is selected on the 2D Map.
 - **[CONTROL]** + **[-]**: Zooms out on the selected object or last camera position if nothing is selected in the 2D Map.
 - **[CONTROL]** + **[↑]**: Brings the camera above the object giving you a bird's eye view.
 - **[CONTROL]** + **[↓]**: Brings the camera under the object giving you a view of the bottom of the object.
 - **[CONTROL]** + **[←]**: Moves the camera counterclockwise around the object.
 - **[CONTROL]** + **[→]**: Moves the camera clockwise around the object.
5. Click the house (home) icon to return to the table of contents.
 6. Click **OK** to return to the Main menu.



To display the browser from any screen during gameplay:

- Press **F11** The browser opens.
- or
- Press **[ESC]** then click **USNI REFERENCE** from the System Menu.
 - Click **OK** to close the browser and return to the game.

PLATFORM-SPECIFIC INFORMATION

You can quickly access information on a specific platform in the game or in the Mission Editor.

During Gameplay:

1. Select the contact on the Nav map then press **[ALT]** + **[I]**.

The USNI Browser opens to the entry for the selected platform. Be aware that the browser provides information on the platform as *classified by you*. If you select a contact you have classified as a Kirov, the browser entry for Kirov is displayed, even if the contact is really a Slava.

NOTE: If Show Truth is ON, the browser displays the correct entry for a selected contact.

2. Click **OK** to return to the game.

In Mission Editor:

1. Assign a country, class and name to the platform. Select the icon on the map and press **[ALT]+[I]**. The browser opens to information on the selected platform.
2. Click **OK** to return to the Mission Editor.

NOTE: No USNI information is available on land buildings, civilian aircraft and sailing vessels. During gameplay and in the Mission Editor, the browser's Main menu displays if you attempt to access platform-specific information about a contact that has no browser entry.

EXIT

To exit the Main menu:

- Click **EXIT**. A *Sub Command* message box appears asking you to confirm that you want to leave the game.
- Click **OK** to exit to Windows.
- Click **Cancel** to return to the Main menu.

SHIP STATIONS

There are seventeen stations plus the Task Bar on each controllable submarine. While the stations on each controllable sub are different in appearance, their basic functionality is quite similar. This section describes what happens at each station. When basic functionality is the same, directions for performing the station's functions are presented with any slight differences between the subs noted under each step. A description of the screen parts and button names for each submarine class follows the list of directions.

When the stations appear or function quite differently, steps for using a station's functions are included separately by submarine class.

NOTE: The Improved Akula-I and the Akula-II submarine stations look and function identically within the game. Both of these classes are referred to as simply 'Akula' in this manual.

GENERAL INFORMATION

SELECTED OPTIONS

On each class of submarine, color is used to designate a selected state for buttons and menu options.

- **Seawolf:** Non-selected buttons and options are orange. Selected buttons and options are green.
- **688(I):** Non-selected buttons and options are green. Selected buttons and options are orange.
- **Akula:** Non-selected buttons and options are red. Selected buttons and options are white.

SYSTEM MENU

The System Menu is available on every submarine and from any ship station by pressing **[ESC]** during gameplay or by selecting System menu from the Nav Map menu. (Right-click the Nav map surface to display the Nav Map menu.)

The following options are available:

- Resume:** Select this option to leave the System menu and resume gameplay.
- Options:** Displays the Options menu.
- USNI Reference:** Displays the USNI Browser.
- Mission Status:** Displays the Mission Status screen giving you access to your captain name, mission name, score, elapsed time, your mission goals and a list of platforms you have destroyed up to this point in the game.
- Save:** Displays the Save Dialog then returns you to the game.
- Save and Exit:** Displays the Save Dialog then exits the mission.
- End Mission:** Exits the mission without providing an opportunity to save the mission.

SEAWOLF BUTTON MATRIX

The Seawolf class utilizes a button matrix on many of its stations.

- Click any button that contains both text and a down arrow to display a panel with additional options related to the clicked button.
- Click **BACK** (up-arrow) to return to the previous matrix panel.
- Click any button that contains only text (no arrow) to perform the described function.

NOTE: In the Button Matrix a selected function is green.

MANUAL DESCRIPTIONS

It is possible to set Game Options that allow you to view the true location and identity of all contacts, only Allied contacts and/or dead platforms on the Nav map and 3D. Except as noted, the directions and descriptions in this manual assume that all Game Options with the exception of Enable Tool Tips are OFF. See *Main Menu/Options/Game* on p. 29.

TASK BAR

The Task Bar appears at the bottom of all stations on all three classes of controllable subs. Task Bar functionality is identical between the submarines and there are only slight cosmetic differences from sub to sub. The Seawolf Task Bar is shown here. Each designated section is described below.



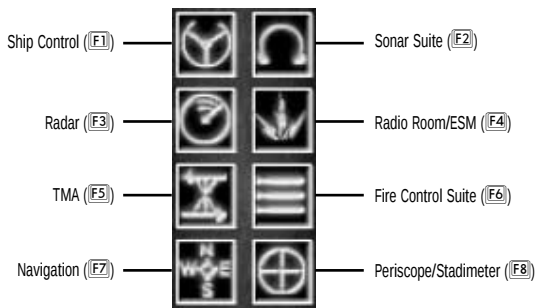
STATIONS MENU



Clicking the Stations menu button displays the pop-up Stations menu. The menu contains icon buttons representing the major ship stations. The buttons are described below. Hold your cursor over a button to display the name of the station. Each ship station is described in full later in this section of the manual.

- Click a specific button to move to that station.

The Stations menu icons are defined below along with their default keyboard shortcuts.



ORDERS MENU



Certain basic orders can be given from any ship station using the pop-up Orders menu on the Task Bar. Click the button to display the available menu options.

FIRE TUBE:

This option appears both here and on Ownship menu only when a target is assigned to a specific tube at the Fire Control Station.

- **Tube Number: Weapon Name/Target ID:** Select a tube number to fire the weapon in the tube at the designated target.

NOTE: This menu option is always visible if a UUV is loaded in a tube. UUVs do not require a target assignment so you need only fire the tube to launch it. See *Special Operations and Procedures/Deploying UUVs* on p. 149.

NAVIGATE

Set Depth

- Surface:** Orders your sub to the surface.
- Go to PD:** Orders your sub to Periscope Depth.
- Go Shallow:** Orders your ship to 100 feet/30 meters.
- Go Deep:** Orders your ship to 800 feet/244 meters. Beware! If you are not in water that deep, you will slam your ship into the bottom of the body of water.

Change Speed

- All Ahead Flank:** Orders ship speed to the top speed possible for the sub you are commanding.
- All Ahead Full:** Orders ship speed to 14 kts less than the top speed possible for the sub you are commanding.
- Ahead Standard:** Orders ship speed to 15 kts.
- Ahead 2/3:** Orders ship speed to 10 kts.
- Ahead 1/3:** Orders ship speed to 5 kts.
- All Stop:** Orders ship to a full stop.
- Back 1/3:** Orders ship speed to 5 kts in a reverse direction.
- Back 2/3:** Orders ship speed to 8 kts in a reverse direction.
- All Back Full:** Orders ship speed to 4 kts less than the top reverse speed possible for the sub you are commanding.
- All Back Emergency:** Orders ship speed to the top reverse speed possible for the sub you are commanding.

MASTS AND ANTENNAS

These menu options appear as long as the mast is still functioning.

- Raise/Lower ESM:** Toggles the state of the ESM Mast (Electronic Support Measures). You must be at the designated depth or shallower and at speeds of 10 kts or less if the sail is submerged to avoid damaging the ESM Mast. For information on ESM see *Ship Stations/Radio Room/ESM Station* on p. 131.
SEAWOLF: 70 ft (PD); 688(i) 65 ft; AKULA 16 Meters (PD)
- Raise/Lower Radio:** Toggles the state of the Radio Mast. You must be at periscope depth or shallower and at speeds of 10 kts or less if your sail is submerged to avoid damaging the Radio Mast. For information on the Radio Room see *Ship Ship Stations/Radio Room/ESM Station* on p. 131.
- Raise/Lower Periscope:** Toggles the state of the Periscope. Raising the Periscope at a speed greater than 10 kts damages the mast if your sail is submerged. See *Ship Stations/Periscope and Stadimeter Stations* on p. 136.
- Raise/Lower Radar:** Toggles the state of the Radar mast. You must be at the designated depth or shallower and at a speed of 8 kts or less if your sail is submerged to avoid damaging the Radar Mast. See *Ship Stations/Radar Station* on p. 129.
SEAWOLF: 70 ft; 688(i) 61 ft; AKULA 115 Meters
- Lower All:** Quickly lowers all masts and antennas.

COUNTERMEASURES

This menu and its options appear as long as Ownship has countermeasures of this type available. Only internal countermeasure tubes can be reloaded. If you have two internal countermeasure tubes containing one each of Active and Passive Decoys, all four of these options appear. This is to permit you to select the depth for the CM. If you Select Active Deep, both Active options disappear since you now have only one CM loaded, a Passive Decoy. Once you launch the Passive Decoy no countermeasure options are available from this menu and you must reload the tubes from the Fire Control station.

If you have two Active Decoys loaded, only the two Active options display in this menu until you have fired both countermeasures. Then no options appear until you reload CMs.

Active Decoy Deep: Selecting this option launches an active decoy to a default depth of 800 ft/244 meters.

Active Decoy Shallow: Selecting this option launches an active decoy to a default depth of 100 ft/30 meters.

Passive Decoy Deep: Selecting this option launches a passive decoy to a default depth of 800 ft/244 meters.

Passive Decoy Shallow: Selecting this option launches a passive decoy to a default depth of 100

NOTE: The Seawolf has eight external countermeasure tubes. The CMs in the external tubes are fired first when this option is selected. You can set countermeasures to a specific depth from the Seawolf's Fire Control Countermeasure Launch Panel. See *Seawolf Fire Control Suite/Seawolf Countermeasure Launch Panel* on p. 120.

HISTORY DISPLAY

The center portion of the Task Bar allows you to select and view a running log, or history, of three types of messages.



HISTORY SELECTION BUTTONS

A lit button indicates the currently selected History type. If you have a message in any other window, that window's selection button flashes until you select the button and view the message in that history window.

Crew Report History: (Blue Circle) Displays the crew reports in the History Window. Crew reports include but are not limited to the crew responses to your orders to change depth and speed. Some tasks performed by the Auto Crew are shown here but are not reported audibly.

Radio History: (Green Square) Displays all radio messages in the History window. Your original tasking brief is found at the top of the history. Messages related to game status also appear here. Latitude and longitude coordinates are easily accessible while viewing the Nav map by opening the Radio History window and scrolling to the coordinates.

Chat History: (Yellow Triangle) During multiplayer games click this button to view new messages and review your chat history in the History window.

HISTORY WINDOW

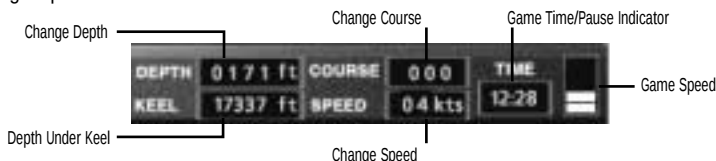
The History window displays a complete history of all crew reports, briefs and all radio traffic, or multiplayer chat messages. Select one of the History Selection Buttons to the left of the window to select which type of message history is displayed. The last two lines of the currently selected history type display in the History window when it is not expanded. When the History window is expanded, a scroll bar appears if the length of the message history exceeds the window opening.

Expand/Contract History Window

- Click the up-arrow to display the entire History window. You may have to scroll to view the entire contents of a given history within the window.
- Click the down-arrow or the map surface to close the History window.

MANEUVER SHORTCUTS AND GAME READOUTS

This area of the Task Bar provides game and Ownship information and provides shortcuts for ordering ship maneuvers.



DEPTH, COURSE AND SPEED

Use the Maneuver Shortcuts to change your depth, course and speed from any ship station. Depth is shown in feet on the U.S. subs and in meters on the Akulas.

To issue a maneuver command:

- Point the cursor at a digit and click to cycle forward through the digits.
- Right-click a digit to cycle backward.
- **Seawolf:** Orange numbers indicate the current depth, course and speed. Digits are green while you click them.
- **688(I):** Green numbers indicate the current depth, course and speed. Digits are orange while you click them.
- **Akula:** Red numbers indicate current depth, course and speed. Digits are white while you click them.

To see the depth, course or speed you ordered while the ship is still maneuvering, visit the Ship Control Station or check the crew report in the History window.

KEEL

This readout allows you to keep track of the water depth under your keel. This is handy when operating in shallow littoral waters.

GAME TIME/PAUSE INDICATOR

The Time field displays the time of day in the mission based on a 24-hour clock. If the game scenario starts at 1:00 p.m., the time field shows 13:00 and increments from that time.

When the game is paused, the word **Paused** replaces the time digits.

- Press **[P]** to pause the game.
- Press **[P]** again to resume gameplay.

TIME COMPRESSION SCALE

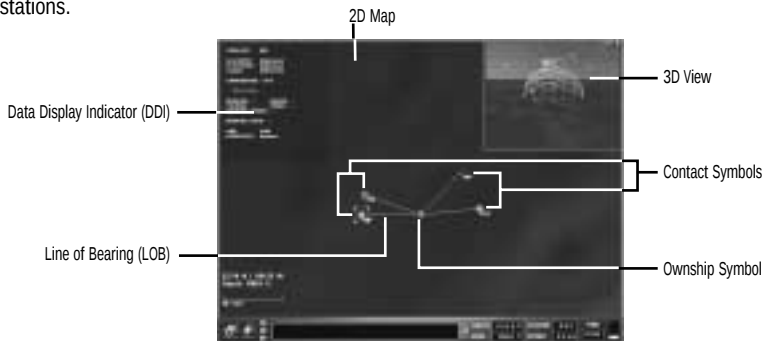
When playing time is a factor or you need to transit for long distances, it is helpful to speed up gameplay. In addition to real time, Sub Command supports four levels of time compression. The time scale displays in the far right of the Task Bar. A stack of colored bars represents time compression.

- At real time, a single green bar is displayed.
- At twice real time a lime (yellow/green) bar appears above the green bar.
- At four times real time a yellow bar is added to the stack.
- At six times real time an orange bar is added.
- At up to eight times real time (depending on system capability) a red bar appears at the top of the stack.
- Press **+** on the number pad or left click on the time scale to toggle through all scales in an increasing order of compression. Real time follows 8x in this rotation.
- Press **-** on the number pad or right-click on the time scale to toggle through all scales in a decreasing order of compression. In this rotation 8x follows real time.

NOTE: Time compression is not available in Multiplayer missions.

NAVIGATION STATION

Each mission begins at the Navigation Station, sometimes called simply Nav. The Navigation Station consists of three areas: the 2D Map, the Data Display Indicator and the 3D View. If you so choose, you can play much of the game from Nav as described later in this section. It is from here that you view all contacts you have marked or designated with your sensors and set the classification for the contacts you classified in the Narrowband Sonar, ESM or Periscope/Stadimeter stations.



2D MAP

The 2D Map represents the 600 by 600 (n.m.) battle space. Not all of the battle space is visible. You must scroll up or down to view the hidden portions. Be aware that some contacts could be hidden behind the 3D window.

- Use the arrow keys to scroll the map in the direction indicated by the arrow.
- Press **[CONTROL]** and click a map location to zoom in on that spot.
- Press **[CONTROL]** and right-click the map to zoom out.
- Press **[ESC]** then select Options from the System Menu.

The lower left corner of the map provides the following information:

- **Latitude and Longitude:** At the location of the cursor.
- **Depth/Height:** Displays the depth of the water or the altitude of the land at the location of the cursor.
- **Range scale:** In nautical miles and yards.
- **Ice Coverage:** As a percentage when ice is present at that map location.

MAP MENU

Right-clicking on the 2D Map surface displays the Map menu. The Map menu contains a variety of tools that allow you to customize your map interface by adding markers and labels and filtering which symbols, text or other map aids display there. The Map menu items are described below.

Filters: Use filters to toggle the display of specific map objects.

ALLIANCES

Hide Threats: Hide/show all contacts designated Threat.

Hide Allies: Hide/show all contacts designated Allied.

Hide Neutrals: Hide/show all contacts designated Neutral.

Hide Unknowns: Hide/show all contacts designated Unknown.

NOTE: If Show Truth is ON and contacts you expect to see do not appear on the Nav map check to see if you have inadvertently turned off the display of one of the alliances.

Hide/Show Tags: Displays or hides the names of all platforms and weapons next to the appropriate symbol. The name that displays is your classification for that contact, which may or may not be correct.

Hide/Show Tracks: Hides or displays the alphanumeric contact IDs.

Hide/Show Marks: Hides or displays all markers you have placed on the map.

Hide/Show Area Circles: Hides or displays any Area Circles you have placed on the map.

Hide/Show Lines: Hides or displays any lines you have placed on the map.

Hide/Show Labels: Hides or displays any labels you have placed on the map.

LAYERS

Show Link Data: Displays the locations of all friendly platforms whether you have detected them or not. This information is provided by various link connections with satellites and other ships on Ownside. Since this data is provided on a time delay, the locations may not be exact but they are the locations with a high level of confidence. These contacts have L designations. L contacts appear on the map but are not selectable in TMA or Fire Control. Select this option again to turn off the display of Link data.

NOTE: Some land-based **L** contacts are visible even if this option is turned off. These land sites were designated as 'automatically detectable' when the mission was created.

Hide/Show Truth: Displays the correct location and identity of all platforms and objects in the game. See *Main Menu/Option/Game/Show Truth* on p. 29.

Drawing tools

Add Mark: Select this option then click the map to place a marker. Double-click the marker to add a label to the marker.

Sub Command TIP: You can also press **e** while your cursor is over the 2D Map to place a marker at the location of the cursor.

Add Area Circle: Select this option, click the map to place the center of the circle, then drag the cursor to define the radius of the circle. Click again when the circle is the desired size. Double-clicking on the center of the circle displays a dialog allowing you to change the radius of the circle and create a label. Click the digits to increment the value. Right-click to decrease the value.

- To delete an area circle click the center point of the circle and press **[DEL]**.

Add Range Circle: Range circles can be added to Ownship and any platform symbol. Select this option then position the cursor over Ownship or the desired contact. The cursor changes shape when it is over a valid contact. Click the contact and drag the circle to the desired size. Click again to place the circle.

- To delete a range circle, right-click the platform to display the Contact menu then select Remove Range Circle.

NAV MAP CONTACTS

When each contact is designated or marked it is given an alphanumeric contact ID that is used on the Nav map, TMA station, Fire Control and other stations in the game.

The first letter of the contact ID represents the source of the data:

S for Sonar (passive, active, UUV)

R for Radar

V for visual/periscope

E for ESM

M for contacts merged in TMA

L for Link

- Click a contact symbol to select the contact.

A contact first appears on the Nav map as a symbol at the end of a LOB. The default length of the LOB depends on which sensor has detected it. The symbol in use is usually the symbol for Unknown (platform type)/Unknown (alliance). See *Contact Symbols* below. The contact's ID number accompanies the symbol. The color and default lengths for lines of bearing are shown here.

Passive Sonar contacts: White, Blue or Purple LOB 10 n.m. long

Active Sonar contacts: Green LOB at the range reported by the sensor.

ESM contacts: Red LOB 20 n.m. long

Visual contacts: Red LOB 10 n.m. long

Radar contacts: Yellow LOB at the range reported by the sensor.

UUV passive sonar contacts: White LOB 10 n.m. from the UUV.

UUV active sonar contacts: Green LOB at the range from the UUV reported by the sensor.

NOTE: Merged contacts and link contacts have no LOBs.

A contact with a TMA solution appears on the map as a symbol at the location designated by the TMA solution you have entered. The line of bearing disappears.

The symbol for a contact changes shape once it is classified. Classification is the process of determining the class of a contact and its alliance. It is important to know that the contact is hostile before launching weapons.

You assign a classification to a contact from the Contact menu's Classify Contact option using information you collect from narrowband sonar, ESM or the stadimeter. These stations are covered individually later in this chapter. (For information on the Contact menu options see *Ship Stations/Navigation Station/Contact Menu* on p. 45.)

When the game begins only your Ownship symbol is visible on the map. You must use your sensors (usually sonar) to detect contacts, then create TMA solutions for them. The symbol for Unknown/Unknown is used for a contact until it has been classified.

See *Ship's Stations/Sonar Stations* on p. 58 for information on contact detection. *Ship's Stations/Target Motion Analysis (TMA) Station* on p. 96 provides information on how to create a TMA solution.

NOTE: If you have selected Novice settings at install or in the Options menu your experience may be different. Blue link contacts may appear and your Auto Crew marks contacts and performs TMA assessments for you so contacts other than Ownship may appear on the Nav map.

CONTACT SYMBOLS

Contacts are displayed on the 2D Map as symbols. These symbols use shape and color to convey a platform's type and its alliance.

Colors

Sub Command uses the following colors to denote side alliances.

COLOR:	ALLIANCE:
--------	-----------

Blue	Ownside/Friendly
Orange	Allied
Red	Hostile
Yellow	Unknown
Green	Neutral

When a platform is destroyed, its symbol turns a shade of gray depending on its alliance. Destroyed platforms belonging to Ownside appear as a light shade of gray while all other destroyed platforms display as a dark shade of gray. The ability to see the symbols of destroyed platforms is on by default. Dead platforms appear on the 2D Map whether you have detected them or not. You can turn OFF this feature on the Options>Game page by deselecting the See Dead Platforms option.

Alliances

Sub Command uses the following definitions when assigning alliances to contacts in missions.

FRIENDLY	Contacts that are either Ownside or friendly to Ownside. Allies are designated Friendly.
HOSTILE	All platforms, weapons, and land-based sites identified as belonging to countries hostile to Ownside.
UNKNOWN	Any contact not yet identified as Friendly, Hostile, Neutral or a Biologic.
NEUTRAL	All platforms allied with neither Friendly or Hostile sides.

The Symbols

The shape of a symbol provides important information concerning the contact's type. Some ships, submarines, airplanes and missiles have a different symbol shape depending on its alliance. Some symbols are the same shape regardless of alliance. In those cases, you must rely on the color of the symbol to determine the alliance of the contact. See Colors above.

SYMBOL	OBJECT	SYMBOL	OBJECT
	Ownship		Surface Ship, Neutral
	Unknown/Unknown (Neither platform type nor its alliance is known)		Missile, Ownside/ Friendly
	Submarine, Ownside/Friendly		Missile, Hostile, Unknown
	Submarine, Hostile		Torpedo
	Submarine, Unknown		Helicopter
	Submarine, Neutral		Mine
	Aircraft, Ownside/ Friendly		Land-based Object
	Aircraft, Hostile		Downed Pilot
	Aircraft, Unknown		Explosion
	Aircraft, Neutral		SEAL Team
	Surface Ship, Ownside/Friendly		UUV (Unmanned Underwater Vehicle)
	Surface Ship, Hostile		DSRV (Deep Submergence Rescue Vehicle)
	Surface Ship, Unknown		Biologic

CONTACT MENU

Once a contact appears on the map, select it by clicking on its symbol. Right-clicking on a contact displays the Contact menu. From this menu you can assign a classification to the contact as well as attack it or find information about it as described below.

Engage With:

Tube X: Select a tube and its currently loaded weapon to fire at this contact. (If you want to change a weapon loaded in a tube, you must visit the Fire Control Station.) The firing solution currently entered for this contact in TMA is used to target the weapon. Be aware that your solution is rarely accurate early in the tracking process. If no TMA solution has yet been entered, the weapon fires down the line of bearing using the default presets for the selected weapon.

NOTE: An Unknown/Unknown contact does not have an Engage With option in its Contact menu.

Until you designate the contact as surface or subsurface the game doesn't know which type of weapons to place in the Engage With menu.

Deploy Special Forces: This menu only appears in the Engage With menu of surface ships and land buildings and only under these conditions:

- Ownship has Special Forces aboard.
- Ownship is traveling at periscope depth or less and at 3 kts or less.

For more information see *Special Operations and Procedures /Deploying and Recovering Special Forces* on p. 148.

Designate Type/Alliance: If you are relatively sure of this contact's platform type or alliance you can assign it here without specifying a ship class. The contact's map symbol changes shape and color according to your selections. 3D view displays a wire-frame model of a generic ship, plane or submarine bounded by a colored box denoting the alliance type. See *Ship Stations/Navigation Station/Contact Symbols/Colors* on p. 43. A bar representing level of confidence is also visible in 3D. You can also assign a level of confidence from this menu option.

NOTE: This menu option does not display if Show Truth is on. See *Main Menu/Option/Game/Show Truth* on p. 29.)

Platform Type: Assign a platform type to the contact: Surface, Submarine, Air, Biologic or Unknown. The contact's symbol changes shape to that of the designated platform type.

Alliance: Assign an alliance to the contact: Friendly, Hostile, Neutral or Unknown. The contact's symbol changes color to that of the designated alliance. See *Contact Symbols /Colors* on p. 43.

Confidence: Assign a level denoting how confident you are in the accuracy of your classification. Select Low, Medium or High.

Classify Contact: Selecting this option displays the Classification Dialog. This option does not display if Show Truth is on. See *Main Menu/Option/Game/Show Truth* on p. 29.

Once you have a good idea of a contact's class use the Classification Dialog to assign that classification to the contact and designate a level of confidence in your assessment.

1. From the class list, select the desired class name. To narrow your search, use the Sort By Type drop-down to eliminate all platform types but the type for which you want to search: Submarines, Surface ships, Aircraft or Biologics. (If you have classified a contact in Narrowband Sonar, the class name that was visible on the screen when you left that station is highlighted in the classification window when you select a contact on the Nav map.)
2. Click the desired class name to assign that class name to the contact. Information and a photo of the selected class appear on the right side of the dialog box.

3. Click LOW, MED or HIGH to indicate your level of confidence in this classification. The classification name and your level of confidence appear in the DDI whenever the contact is selected on the map.
4. Assign an Alliance to the contact. Click ALLIED, THREAT, NEUTRAL or UNKNOWN.
5. Click **OK** to accept the classification. Click **CANCEL** to return to the game and negate your changes.
6. When you click OK, your classification is applied and the contact's symbol appears as that of the specified platform type.
7. When you click a classified contact in the Nav map, a 3D model of that platform class appears in the 3D view. The 3D view displays whatever class you have assigned, whether you are correct or not!



Show History: Displays a dot trail on the map indicating the movement of this contact as you have tracked it with your sensors.

Platform Reference: Displays the USNI Reference entry for the selected contact as classified by you. If you classify the contact as a Kirov, the entry for Kirov appears, even if the contact is really a cruise ship. If you have not classified a contact, no information appears.

NOTE: USNI data provides information on military ships and aircraft. No information is available on buildings, civilian aircraft and sailing vessels.

Spec Ops

Deploy DSRV: This menu option only appears on a submarine's Contact menu and only if these conditions are met:

- The DSRV is loaded on Ownship.
- Ownship is moving at 3 kts or less and is at or below periscope depth.

When this option is selected the DSRV launches and proceeds to the selected submarine. Be aware that the DSRV will attempt to mate with whichever sub you have selected whether or not this is the sub you have been tasked to rescue. Make sure you are not trying to rescue a hostile sub.

Remove Range Circle: If a range circle has been added to the contact's symbol, this option becomes available. Select this option to remove the range circle.

OWNSHIP MENU

Right-clicking on the Ownship symbol displays a set of options specific to Ownship.

Fire Tube: This option only appears here (and on the Orders menu) when you have assigned a target to a tube and defined presets for the weapon from the Fire Control Station or if there is a

UUV loaded in a tube. When this option appears, a second level menu is available that lists any tube that has a weapon assigned and displays the assigned target.

Tube (Number): (Weapon) (Target): Select the desired tube number to fire that tube's weapon at the target ID shown.

Navigate

Set Waypoints: Select this option to add waypoints to Ownship on the Nav map. With each click a new waypoint is added. Press **[END]** or right-click to complete the process.

Placing Ownship waypoints automatically activates your Auto-Helmsman. He follows the waypoints until you order a change in course. See *Playing from the Nav Station/Ownship Waypoints* on p 50.

- Double-click a waypoint to specify a specific lat/long.

Change Course: Select this option then click the Nav map to order a course in that direction.

Set Depth: See the *Ship Stations/Task Bar/Orders Menu* on p. 36 for a full description of these options.

Change Speed: See the *Ship Stations/Task Bar/Orders Menu* on p. 36 for a full description of these options.

Masts and Antennas: Ownship's masts and antennas can be raised and lowered using this menu's options. For a full description of these options see *Ship Stations/Task Bar/Orders Menu* on p. 36.

Show History: Select this option to display movement history for Ownship. A dot is placed every two minutes showing the location of the platform at that point in time.

Platform Reference: Displays the USNI Reference for Ownship.

Remove Range Circle: Only appears if a range circle has been added to Ownship's symbol. Select this option to remove the range circle.

Hide/Show Waypoints: Only appears if you have added waypoints to Ownship.

Remove Waypoints: Only appears if you have added waypoints to Ownship. Select this option to remove waypoints.

Resume Waypoint Follow: Only appears if you have added waypoints to Ownship and have ordered Ownship to a different course (i.e., Ownship is not currently following the waypoints on its own.) Select this option to return Ownship to the assigned waypoints. See *Playing from the Nav Station/Ownship Waypoints* on p. 50.

DATA DISPLAY INDICATOR (DDI)

The Data Display Indicator (DDI) provides information about a selected contact. When you enter the game, only the Ownship symbol is visible on the 2D Map. If you select the Ownship symbol, information relative to Ownship appears in the Data Display area in the upper left corner of the Nav.

When you or your TMA Auto Crewman have entered a solution for a contact, the solution fields contain data when that contact's symbol is selected. The solution section contains the current firing solution that is used when targeting the selected contact. This is set when you enter a solution from the TMA station. (See *Ship Stations/Target Motion Analyses (TMA) Station* on p. 96.)

Bear in mind that the information in the DDI is only as accurate as your classification and TMA solution. It represents your current 'best guess' about the selected contact.

When a contact is selected on the 2D Nav map the following information is available:

Contact: Displays the contact ID number: S01, R01, E01, V01 etc.

Alliance: Displays presumed alliance: Friendly, Hostile, Neutral as designated by you.

Platform: Displays the presumed platform type: Surface, Submarine, Air or Biologic as designated by you or your Sonar Auto Crewman.

Class: Displays the class as designated by you or your Sonar Auto Crewman.

Confidence: Displays the current level of confidence in the classification as designated by you or your auto crewman. Defaults to **LOW**.

Solution: The information in the three rows of the solution section represents the last solution entered in TMA station by you or your TMA Auto Crewman. These fields are blank until a solution has been entered in TMA.

Bearing: Displays the bearing to the contact as designated in the TMA Solution.

Range: Displays the current estimate of the range to the contact.

Course: Displays the estimated course of the contact.

Speed: Displays the estimated speed of the contact.

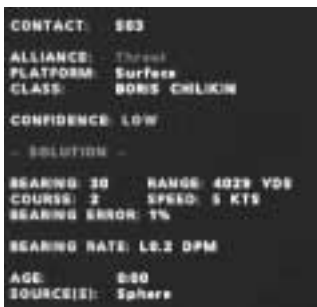
Bearing Error: The average of the bearing error that is displayed in the TMA dot stack.

Bearing Rate: Represents the change in bearing of the contact over time. A high bearing rate could indicate that the contact is close. The contact could also be farther away but moving very rapidly. An **L** or **R** (for left and right) precedes the bearing rate number. If looking down the line of bearing, an **L** means that the contact is moving to the left, **R** means that it is moving to the right.

Age: The amount of time that has passed since you last updated the firing solution.

Source(s): Displays sensor input for this contact.

Data Display Indicator (DDI)



CONTACT: BOB
ALLIANCE: Threat
PLATFORM: Surface
CLASS: BOMB CHICKEN
CONFIDENCE: LOW
- SOLUTION -
BEARING: 30 RANGE: 4028 YDS
COURSE: 2 SPEED: 5 KTS
BEARING ERROR: 1%
BEARING RATE: L0.2 DPM
AGE: 0:00
SOURCE(S): Sphere

NOTE: When Show Truth is on, the DDI displays the selected contact's actual name, class, course, speed and percentage damage.

3D VIEW

3D view is on by default in the small retractable window in the upper right of the Navigation Station. The position of the 3D View and the 2D Map can be switched to provide a larger 3D view.

- Press **[CONTROL]** + **[M]** to swap the position of the 2D Map and the 3D view.
- Or click the swap window button next to the up arrow in the upper right corner of the Navigation Station.

3D VIEW CONTROLS

Use these keys to adjust the 3D view.

- Click the 3D model and drag the mouse to rotate the angle of your view.
- Press **[CONTROL]** and left-click and drag or use the mouse wheel to zoom in and out.
- Press **[SHIFT]** + left-click and drag left or right to pan.
- Press **[CONTROL]** + **[=]** to zoom in on the selected object or last camera position if nothing is selected on the 2D Map.
- Press **[CONTROL]** + **[-]** to zoom out on the selected object or last camera position if nothing is selected in the 2D Map.
- Press **[CONTROL]** + **[↑]** to bring the camera above the object giving you a bird's eye view.
- Press **[CONTROL]** + **[↓]** to bring the camera under the object giving you a view of the bottom of the object.
- Press **[CONTROL]** + **[←]** to move the camera counterclockwise around the object.
- Press **[CONTROL]** + **[→]** to move the camera clockwise around the object.

DISABLING AND HIDING 3D

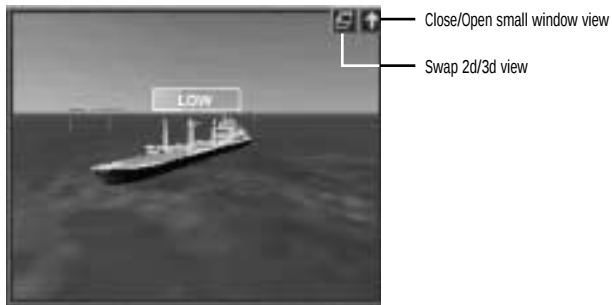
As mentioned previously, the purists may prefer to disable 3D completely. This is done on the Options>3D page. You can also hide 3D from within the game without disabling it completely.

- Press **[CONTROL]** + **[A]** to hide the small window. Since 2D and 3D can be swapped, whichever view is in the small window is hidden.
- Or click the up arrow in the upper right of the Navigation Station to hide the small window. The arrow changes to a down arrow.
- Click the small down arrow to display the small window again.

Remember that until a contact is classified, clicking on its symbol displays a transparent bubble floating on the water in the 3D view. Until a specific classification has been assigned to a contact, no specific 3D model can be displayed. If you have designated a type and alliance to a contact using the Contact menu's Designate Type/Alliance option, a generic model of the platform type is seen in the 3D View when you select the contact. Box corners of the color representing the assigned alliance surround the model.

A bar indicating level of confidence is also present in the 3D view. Green indicates low confidence, yellow indicates medium level of confidence, and red indicates high confidence in your classification of the selected model.

Remember, unless the Show Truth cheat is on, the location of the 3D object coincides with the location of your TMA solution and is only as accurate as your TMA assessment! See Main Menu/Options/Game/Show Truth on p. 29.



PLAYING FROM THE NAV STATION

With your Auto Crew activated, it is possible to play much of the game from the Navigation Station. Using a combination of voice commands, and the Orders, Contact and Ownship menus you can navigate, track, classify and attack enemy ships, launch Special Forces, and read your message traffic. You still need to go to the Periscope Station to see the outside world or conduct an ESM search. You must go to the Fire Control Station if you want to reload a tube, enter specific weapon presets or wire guide a torpedo.

ATTACKING SEA TARGETS FROM NAV

To select a sea contact, a contact symbol must be present on the Nav map. When ON, your Sonar Auto Crewman marks and classifies contacts. The TMA Auto Crew creates a firing solution for contacts within range of your submarine.

TO LAUNCH WEAPONS AGAINST SURFACE AND SUBMARINE TARGETS

Using the Contact menu:

1. Right-click the contact symbol to display the Contact menu.
 2. Select Engage With and specific tube number. The name of the weapon loaded in the tube appears after the tube number.
- If the Fire Control Auto Crewman is ON, presets are entered for the weapon based on the firing solution information and the platform classification.
 - If the Fire Control Auto Crewman is not ON, weapons fired from the Nav Station use the default weapon settings.
 - The Engage With menu does not appear for Unknown/Unknown contacts displaying a line of bearing. For contacts with a LOB and a classification, the Engage With menu displays weapons appropriate for the type of platform specified.

Using Orders or Ownship Menu:

Fire Tube: If you have assigned a target to a tube from the Fire Control Station, this menu option is available on these two menus.

- Select the desired tube to fire the weapon.

NOTE: An Unknown/Unknown contact does not have an Engage With option in its Contact menu.

Until you designate the contact as surface or subsurface the game doesn't know which type of weapons to place in the Engage With menu.

LAUNCHING LAND ATTACK MISSILES FROM NAV

Land contacts with an L designation can be targeted from the Nav with a land attack missile.

1. Right-click the land contact to display the Contact menu.
2. Select Engage With. Only Land Attack Missiles are available from the menu. If no Land Attack Missiles are loaded in any of your tubes there will not be an Engage With option.
3. Select the desired tube. The weapon launch sequence is initiated and cannot be stopped.

OWNSHIP WAYPOINTS

Whether you play the game from the Navigation Station or spend your time in Sonar and TMA, it is nice to give your helmsman some standing orders and let him steer the ship. Placing waypoints on the map automatically activates the Auto Helmsman. See *Ship's Stations/Auto Crewmen* on p. 146 for information on how to utilize this crewman.

Place waypoints through a tricky strait, around islands or set them to take you toward a specific destination.

To place a waypoint on the map:

1. Press **[INS]** or select Add Waypoint from the Ownship menu.
2. Click the map to place a waypoint.
3. Continue to click the map until the desired waypoints have been placed.
4. Right-click the map or press **[END]** to stop the process.

To add a single waypoint:

1. Click the Ownship symbol.
 2. Press **[CONTROL] + [INS]** then click the map.
- If no other waypoints exist, a single waypoint is placed from Ownship.
 - If other waypoints already exist, the additional waypoint is added after the last existing waypoint.

Some Restrictions

- Waypoints cannot be added or moved over land or water too shallow for a submarine.
- Waypoints cannot be added or moved in such a way as the direct path to the previous or next waypoint crosses land or water too shallow for a submarine.

VOICE COMMANDS

There are a variety of voice commands available during gameplay if you installed the speech recognition software when you installed *Sub Command*. Voice commands behave similarly to their keyboard counterparts and can only be used where a keyboard command is appropriate (e.g., they are ignored when dialogs are visible). Voice commands are only recognized during gameplay but not on the Options menu when accessed during gameplay.

You can train your speech engine by visiting the speech control panel accessed via the Speech icon in the Windows 98, Windows 2000, or Windows ME control panel. You can also improve the accuracy of the speech engine by adjusting the accuracy vs. performance slider in the speech control panel.

NOTE: The speech recognition software is not compatible with Windows 95. If you attempt to install the game on a Windows 95 platform, the option to install the speech recognition software is not seen.

NOTE: The document *Voice Commands.doc* resides on the *Sub Command* CD and contains a list of voice commands recognized by the game.

To utilize voice commands in the game:

1. Select Options>Sound.
2. Under the Speech heading select Enabled and, if desired, Always On. Always On is only available when Enabled is checked.

NOTE: Both options are grayed if you do not have a speech engine installed.

When Enabled only is selected on the Options>Sound page:

- Press and hold the speech key while issuing a valid voice commands. By default the speech key is **SPACEBAR**.
- When the designated speech key is pressed during gameplay, voice recognition is listening and the speech engine interprets anything you say. When this key is released, voice recognition is not listening and it ignores anything you say.

When Always On is selected on the Options>Sound page:

- Issue a valid voice command as desired at any point during gameplay.
- When the Always On option is checked, the designated speech key is ignored and the speech engine is always listening to what you say.

SHIP CONTROL



Ship Control is the hub of operations on a submarine. From here the Captain and the Officer of the Deck oversee all the ship's movements and activities. In *Sub Command* the ship's speed, course and depth can be altered from the Task Bar or by using voice or menu commands. Because of these options, you need only visit Ship Control for specific evolutions that are performed infrequently.

SHIP CONTROL TASKS

Each sub's Ship Control Station is covered separately later in this section. The main tasks and maneuvers conducted from the Ship Control Station are described here.

Stream or retrieve the towed array: The most common task performed in Ship Control is to stream the towed array, one of your sub's most important sonar sensors. From here you can deploy the selected array completely or partially, and retrieve the array if you anticipate maneuvers that could cut it or cause it to drag on the bottom. Backing up cuts the towed array.

Sub Command Tip: When you start a mission check to see if the array is deployed. If it is not, streaming the array should be the first thing you do. The mission designer determines if the array is already streamed when the mission starts.

Emergency Surface the Ship: From Ship Control you can also quickly surface your ship in an emergency situation. During a procedure called an Emergency Main Ballast Tank Blow, or simply Emergency Blow, high-pressure air is blown into the ballast tanks causing the ship to quickly rise to the surface. How quickly you ascend depends on the amount of air available in your air banks.

Charge the Air Banks: High-pressure air is needed to launch weapons and to surface the ship in an emergency. Keep a close eye on the amount of air in your high-pressure air banks. Each weapon launched depletes your supply of high-pressure air. A charge of at least 50% is required to successfully launch weapons from your torpedo tubes. An Emergency Blow procedure can completely drain the banks resulting in the inability to launch weapons or emergency surface again.

NOTE: You can increase the high-pressure charge by only 10 percent while submerged.

Ventilation: To fully charge your high-pressure air banks you must be at periscope depth *and* ventilating.

Open/Close MBT (Main Ballast Tank) Vents: If you are on the surface, opening the MBT vents floods the tanks with water and allows the ship to dive. These vents must be closed after diving so air can be pumped back into the tanks allowing the ship to surface again. When you are submerged these vents should remain closed. Your crew automatically opens and closes the MBT vents when you order the ship to dive or surface. As Captain, you don't need to operate the MBT vent manually, unless you want to.

Change Course, Speed and Depth: In Ship Control you can view the ordered as well as the actual course, speed and depth. You can also change course and speed with a single click using the Course Indicator and the Engine Order Telegraph.

The **Stern, Bow** and **Rudder** Indicators denote the positions of the respective control surfaces of the ship. Zero represents a neutral setting for the bow/stern planes and the rudder. While your Helmsman automatically controls all control surfaces whenever you order a depth or course change, you can, if you like, manually set a rudder angle to change course. The ship will continue to turn in the designated direction until you click zero on the Rudder Indicator or order a new course using the Course Indicator or the Course shortcut.

The Seawolf's trim display includes its Under Ice Display. 688(I)'s Ship Control contains its High Frequency Sonar display. All three Ship Control Stations are described separately below.

SEAWOLF: SHIP CONTROL STATION

The Seawolf's Ship Control Station is divided into two halves. The left half of the station provides mostly information. Only the Course Indicator and the Rudder Indicator allow for user interaction. The right side contains the Trim and Ice Display, the Engine Order Telegraph and the controls for the towed array and several ship systems.



Seawolf's Ship Control Station employs the following conventions.

- A green outline (or needle) and a finger cursor indicate that user input is possible in that location.
- Button text indicates what happens when you next click the button. Button text changes to facilitate this feature. The only exception is the Emergency Blow button. That button text is green when a blow is in progress and orange when it is **OFF**. The text does not change.
- An orange outline around a box or feature indicates no user input is possible. The two exceptions to this are the Rudder and Course Indicators.
- Orange text on a button indicates that ship system is **OFF** or closed.
- Green text indicates that the system is **ON** or functioning.
- In the Engine Order Telegraph the selected button is green.

Seawolf's Ship Control Station features are described briefly below. For more detailed information about the use of these features and tasks performed at the Ship Control Station see *Ship Stations/Ship Control/Ship Control Tasks* on p. 52.

Ordered Depth: Displays the last ordered depth.

Ordered Heading: Displays the last ordered heading.

Ordered Speed: Displays the last ordered speed.

The Engine Order Telegraph: Click the desired button to order engine speed. Engine speeds translate to ship speeds as defined in *Ship Stations/Task Bar/Orders Menu* on p. 36.. Flank (maximum) speed for the Seawolf is 35 kts. Place the cursor over a button to display the engine speed that button sets.

Heading: Displays the sub's actual heading.

Speed: Displays the sub's actual speed.

High-Pressure Air Bank: Displays the current charge level in the high pressure air banks.

Depth: Displays the sub's actual depth.

Sounding: Displays the depth of the water under your hull.

Course Indicator: The orange needle indicates the ordered course. The green needle indicates the current course.

- Click the desired bearing on the dial to order a new course heading.

Stern/Rudder/Bow Controls: Indicates the positions of the respective control surfaces of the ship. Zero represents a neutral setting for the bow/stern planes and the rudder.

- Click the desired number in the Rudder Indicator to order a rudder change.
- Click zero in the Rudder Indicator or click in the Course Indicator to reset the rudder.

NOTE: The ship will eventually turn in a circle if you do not reset the rudder to zero or order a specific course.

Trim and Ice Display: Displays the ship's trim angle, shows the ice thickness profile when under the ice, and displays the current depth beneath the hull when in shallow water.

- The submarine profile adjusts in the display window to match the ship's trim angle.
- When operating under the ice a profile of the ice thickness above Ownship appears across the top of the Trim Display. Any course change immediately redraws the profile. The Ice Thickness Readout in the lower left of the display reports the thickness of the ice directly above the sail.
- When the ship is traveling close to the bottom, an orange line indicates the depth directly under the Ownship's midpoint.

Emergency Blow: Click this button to perform an emergency main ballast tank blow to quickly surface the ship. The button text changes to green when a blow is in progress. Click the button again to return to the **OFF** (orange) position.

Open MBT Vents/Close MBT Vents: When you are surfaced, click Open MBT Vents to open the main ballast tank vents and submerge your ship. Click Close MBT Vents to close the vents once submerged. Your crew automatically opens and closes the vents when you order a dive. You can open and close the vents yourself if you prefer.

Ventilate/Secure Ventilate: Click Ventilate to commence ventilation. Click Secure Ventilate to stop ventilating. Ventilation is only necessary when you need to recharge the high-pressure air banks. (See *Charge Air/Secure Air* below.) The ship must be at or above periscope depth (69 ft.) to ventilate.

Charge Air/Secure Air: Click Charge Air to start the charging the High Pressure Air Banks. Click Secure Charge to stop charging. You must be ventilating to fully charge the banks.

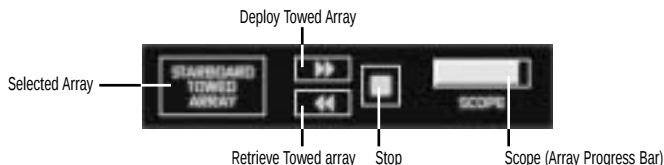
Rig in Bow Planes/Rig Out Bow Planes: The ship's bow planes are out by default. If you plan to surface when under the ice, you should rig in (retract) the bow planes as a precaution against damage. Click Rig in Bow Planes to retract the bow planes. Click Rig Out Bow Planes to return the planes to their normal position.

Towed Array Controls:

The Seawolf has two towed arrays the TB-29 and the TB-16. In general, the TB-29 is longer and more sensitive than the TB-16, but the TB-16 remains effective at higher speeds.

- Select the Starboard Towed Array to deploy the TB-29 array.
- Select the Port Towed Array to deploy the TB-16.

The Seawolf's Towed Array controls are shown below.



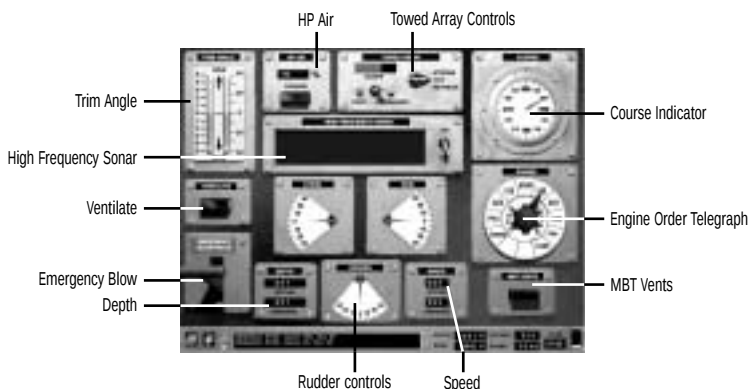
Starboard Towed Array/Port Towed Array: Click the array name to toggle between the array options. The visible name is the selected array.

- Click the right facing double arrows to deploy the selected towed array.
- Click the left facing double arrows to retrieve the selected array.
- Click the orange square to stop streaming or retrieving.

Scope: The scope progress bar illustrates the length of the array currently deployed.

688(I): SHIP CONTROL STATION

688(I)'s Ship Control Station is shown below.



688(I)'s Ship Control Station features are described briefly below. For more detailed information about tasks performed at this station see *Ship Stations/Ship Controls/Ship Control Tasks* on p. 52.

Trim Angle: Indicates the trim angle of the ship measured from a horizontal axis. A positive trim angle indicates the ship has a bow-up attitude. A negative trim angle indicates a bow-down

attitude. Your helmsman automatically controls the trim angle whenever you order a depth change.

HP Air: This panel is used to monitor the current charge level in the high-pressure air banks and to charge the banks when they are depleted. A charge of 50% is necessary for successful weapon launches. The charge can be increased by only 10% when the ship is submerged. You must come to Periscope Depth and ventilate while you charge to fully charge the banks.

- Click the unlit Charge button to commence charging your high-pressure air banks. The button is lit when a charge is in progress.
- Click the lit Charge button to secure the charge.

Towed Array: From this panel you select and deploy the desired towed sonar array (Port or Starboard). The Scope field indicates the length or percentage of the array currently streamed.

- Click Port or Starboard to select that array to be streamed. Only one towed array can be deployed at a time.
- Click Stream to deploy the array.
- To stop streaming or retrieving the array, click OFF.
- To retrieve the towed array, click Retrieve.

Course: On this Course Indicator, the red needle indicates current course. The black needle indicates ordered course

- To order a new course heading, click the desired bearing on the Course Indicator.

High Frequency Sonar: The toggle switch activates the High Frequency Sonar System (HFSS), which is used to detect small objects such as mines at short range. The High Frequency Sonar screen shows the location of any object near your submarine's bow. If an object is close enough, clicking on it designates it as a sonar contact.

- Click **ON** to activate HFSS.
- To designate targets (such as mines), point the cursor at the object and click. A mark is placed on the Nav map indicating each return received by the HF sonar.

Ventilate: Ventilation is only necessary when you need to recharge the high-pressure air banks. See *HP Air* above. The ship must be at or above periscope depth (65 ft.) to ventilate.

- Click the unlit Ventilate button to commence ventilating.
- Click the lit Ventilate button to secure ventilating.

Stern/Bow/Rudder: Your crew controls the bow and stern planes automatically when you change depth but you can order a course change with the Rudder.

- Click the desired number in the Rudder Indicator to order a Rudder change.
- Click zero in the Rudder Indicator or click in the Course Indicator to reset the rudder.

NOTE: The ship will eventually turn in a circle if you do not reset the rudder to zero or order a specific course.

Engine: This dial known as an Engine Order Telegraph orders engine speed. Engine speeds translate to ship speeds as defined in *Ship Stations/Task Bar/Orders Menu* on p. 36. Flank (maximum) speed for the 688(I) is 32 kts.

- Click the desired option to order that Engine Speed.

Emergency Blow Valve: To surface your ship quickly in an emergency situation, click the red handle to initiate the Emergence Blow procedure. Click again to secure the blow. Remember to recharge your air banks following an Emergency Blow.

Depth: Actual and ordered depth is shown in feet.

- Right/left click the digits in the ordered field to order a new depth.

Speed: Actual and ordered speed is shown in kts.

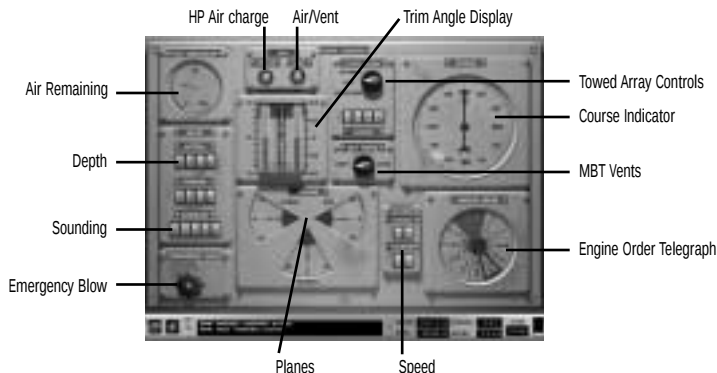
- Right/left click the digits in the ordered field to order a new speed.

MBT Vents: The main ballast tank vents are opened and closed automatically by your crew when you order the ship to dive or surface. If you so choose, you can open and shut the vents manually.

- Click the unlit MBT Vents button to open the vents and submerge the ship.
- Click the lit MBT Vents button to close the vents.

AKULA: SHIP CONTROL

The Akula's Ship Control Station and features are seen below.



Akula's Ship Control Station features are described briefly below. For more detailed information of tasks performed at this station see *Ship Stations/Ship Control/Ship Control Tasks* on p. 52.

Air Remaining: Indicates the charge level in the high pressure air banks.

Air/Charge: Initiates a charge of the high-pressure air banks. The charge can be increased by only 10% when the ship is submerged. You must ventilate to fully charge the banks. A minimum charge level of 50% is necessary to successfully launch weapons.

- Click the Charge button to commence charging the air banks. A red light surrounding the button indicates the charge is in progress. Click again to secure the charge.

Air/Vent: (Ventilate) In order to fully charge the high-pressure air banks you must be at periscope depth (16 meters/52 feet) and ventilating as well charging.

- Once at periscope depth, click the Vent button. The button is ringed in red when ventilating is in progress. Click the Vent button again to secure ventilation.

Trim Angle: Indicates the trim angle of the ship measured from a horizontal axis. A positive trim angle indicates that the ship has a bow-up attitude. A negative trim angle indicates a bow-down attitude. Your helmsman automatically controls the trim angle whenever you order a depth change.

Towed Array: The Akula has one towed sonar array. Since it takes a while for the array to deploy and settle out it is important to deploy it early in the mission. The length of the array currently deployed is displayed in the Length readout. The Akula's towed array is fully deployed at 304 meters (approximately 1000 feet).

- Click Stream to deploy the towed array.
- To stop the streaming or retrieval of the array, click **OFF**.
- To retrieve the towed array, click Retrieve.

MBT Vents: The main ballast tank vents are opened and closed automatically by your crew when you order the ship to dive or surface. If you so choose, you can open and shut the vents manually.

- Click Open to open the vents and submerge the ship.
- Click Shut to close the vents.

Course: On this Course Indicator, the orange needle indicates current course. The gray needle indicates ordered course

- To order a new course heading, click the desired bearing on the Course dial.

Engine Order: The Engine Order Telegraph orders engine speed. Engine speeds translate to ship speeds as defined in *Ship Stations/Task Bar/Orders Menu* on p. 36. Flank (maximum) speed for the Improved Akula-I is 28 kts. Flak Speed for the Akula-II is 30 kts.

- Click the desired option to order that Engine Speed.

Depth: Actual and ordered depth is shown here in meters.

- Right/left click the digits in the ordered field to order a new depth.

Speed: Actual and ordered speed is shown here in kts.

- Right/left click the digits in the Ordered field to order a new speed.

Planes: Your crew controls the bow and stern planes automatically when you change depth but you can order a course change with the Rudder.

- Click the desired number in the Rudder Indicator to order a Rudder change. The gray needle indicates the ordered rudder position. Orange the actual position.
- Click **0** in the Rudder indicator or click in the Course indicator to reset the rudder.

NOTE: The ship will eventually turn in a circle if you do not reset the rudder to zero or order a specific course.

Sounding: This readout shows the depth under the keel in meters.

Emergency Blow: Blows high-pressure air into your ballast tanks to emergency surface your ship. Remember to recharge your air banks following an Emergency Blow.

SONAR STATIONS



At the Sonar Stations you monitor the most important sensing equipment on board your submarine. Six displays, each with a specific purpose, help detect, identify, track, and pinpoint contacts by employing either active or passive sonar. The sonar suite is composed of these six displays: Broadband, Narrowband, DEMON, Active, Active Intercept, and Sound Speed Profile (SSP). All six stations are explained in this section. Information about UUV sensors and their use is covered in *Special Operations and Procedures/Deploying UUVs* on p. 149.

SONAR STATION SELECTION BUTTONS

On all sonar stations six buttons are always visible and permit you to move from one sonar station to another. The buttons contain the same icons regardless of which sub class you are commanding. During gameplay place your cursor over a button to display the name of the station reached by clicking the button.



Broadband Sonar Station



Narrowband Sonar Station



DEMON Sonar Station



Active Sonar Station



Active Intercept Sonar Station



Sound Speed Profile (SSP) Sonar Station

ABOUT SONAR

In order to understand the functions of the Sonar Suite it is important to understand a bit about sonar. Sonar is used to detect both submarines and surface ships and it is your only sensor when operating below periscope depth. There are two types of sonar: **passive** and **active**.

A **passive** sonar system consists of a set of hydrophones (sensors) that receive sounds produced by other sources. Passive sonar can be used only to listen. Its major purpose is to detect and classify other ships. Under optimal conditions, modern passive sonar can sense ships over several nautical miles, thus allowing the submarine to detect potential targets or enemy ships long before it comes into the range of their sensors. However, passive sonar has its limitations. With passive sonar, the sonarman can only determine the direction, or *bearing*, of the sound source. The distance to the other ship (*range*)—an important consideration when maneuvering into an attack position and programming weapons—is initially unknown.

The same is not true of **active** sonar, which operates on the principal of echo ranging. An active sonar system transmits a high-energy acoustic signal or “ping”. Objects in the area reflect the sound, and the resulting echo is picked up by the submarine’s hydrophones. The lag in time between the initial transmission and the returning echo reveals the target’s range with great precision.

The obvious advantage of active sonar is that it provides instant range information. The disadvantage is that the active transmission can be received by enemy ships and used to locate the transmitting submarine. Because of this risk active sonar is used only as a last resort for determining a target's range.

Target range can be determined with passive sonar, too. Using a process called Target Motion Analysis (TMA), you can accurately determine another ship's bearing, range, course, and speed (in other words, its location in two dimensional space) simply by tracking the target with passive sonar. See *Ship Stations/Target Motion Analyses (TMA) Station* on p. 96 for more information.

SONAR ARRAYS

All controllable submarines in *Sub Command* have some form of bow, towed and hull arrays although their capabilities differ. An array is an interconnected group of hydrophones or transducers that focus either the transmission or reception of sound. Together the arrays provide omnidirectional sonar detection capabilities; however, no array in itself provides full 360° detection. This is because the ship itself masks a certain amount of the environment from the sensor.

Spherical/Cylindrical Bow Array

The spherical/cylindrical array in the bow can track broadband as well as narrowband contacts. Passive detection ranges from approximately 750 Hz to 2.0 kHz. In active mode, the array transmits and detects at a higher frequency range of approximately 1.5 kHz to 5.0 kHz.

The spherical/cylindrical array can process broadband signals. At higher speeds, there is some degradation of performance because of flow noise caused by the water moving across the surface of the array. The bow array is not as sensitive to low frequencies, so it's not the array of choice for narrowband contacts emitting only low frequencies.

Hull/Conformal Array

The hull/conformal array, also near the bow of the ship is a linear array that provides low speed capability to detect low frequency narrowband contacts (50 Hz -to-1.0 kHz). As such, its primary use is for classifying targets.

AN/BQG-5 Wide Aperture Array (WAA): the WAA consists of three flank arrays on each side of the SSN21 class submarines. The WAA can provide rapid passive localization (RAPLOC) for sonar contacts within a 15 kyd range.

Towed Array

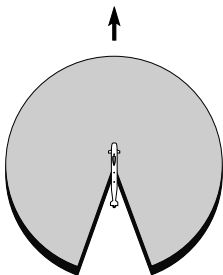
The towed linear array—pulled behind the submarine on a long tow cable so it won't pick up the submarine's own machinery noise—is used for both broadband and narrowband detection and tracking (10 Hz–1.0 kHz). It is used at low to medium speeds, and is optimized for lower frequencies. All controllable submarines in *Sub Command* have at least one towed array. The capabilities of the towed arrays vary from class to class.

The SSN21 carries these two different towed arrays, the AN/TB-16 and the AN/TB-29. The TB-16 is a 3.5-inch diameter array, which is thicker than the thin line TB-29 array. The TB-16 will suffer less self-noise than the TB-29 at a given speed, but the TB-29 will be more effective at the lower frequencies.

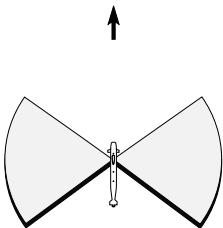
SONAR LIMITATIONS

The location of the sensor as well as physical conditions such as the propeller wash of your ship can limit which sounds can reach your sensors. The towed array can not pick up contacts in front of your submarine and the spherical array can not pick up contacts behind the ship.

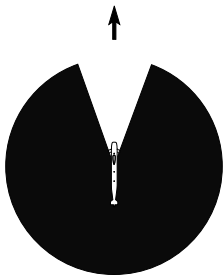
The Spherical/Cylindrical Array detects contacts in the areas around Ownship as shown below.



The Hull/Conformal Array detects contacts in the areas around Ownship as shown below.



The Towed Array detects contacts around Ownship as shown below.



BROADBAND SONAR



The Broadband Sonar Station displays input from the spherical/cylindrical bow, and towed arrays. In the Akulas the data from the conformal array is also available in the Broadband Sonar Station. These inputs are used to detect and track submarines and surface ships. Here trackers can be assigned to contacts and they are given an alphanumeric Contact Designation or ID. Contact IDs for all sonar contacts begin with the letter S. Trackers provide the TMA station with updates on the contact's bearing at specified time intervals.

NOTE: UUV sonar contacts also have Sierra (S) designations, but their data is not reported in the Sonar Suite. UUV data is available in TMA and on the Nav and Fire Control maps.

SEAWOLF AND 688(I): BROADBAND WATERFALL DISPLAYS



Both the 688I and Seawolf submarines utilize dual waterfall displays to track sonar information. In the waterfall display, sonar information 'cascades' down over time giving a sense of the contact's movement. Bearing is displayed on the horizontal axis with either north (000) or south (180) in the center. Time is displayed on the vertical axis, with the most recent information at the top.

A thin line beneath the V indicator indicates the direction your submarine's stern is pointing. A faint orange (Seawolf) or green (688I) line represents a weak contact while a strong contact appears as a brighter, thicker line. The speckled background represents background noise interference. The amount of interference increases as background noise increases.

Both the upper and lower waterfall displays show broadband sonar data. It is a good idea to have one display set on Short Time Average (1–60 seconds) and the other on Intermediate (0–30 minutes) or Long (0–2 hours). The longer the time averaging that is employed the better the sonar detection processing. However, the longer the time averaging, the longer the time between contact updates. Both the spherical sensor and the towed array pick up broadband data in the Seawolf and 688(I). The information displayed depends on which sensor is selected.

AKULA: BROADBAND CIRCULAR SSAZ DISPLAY



The broadband display in the Akulas is circular and represents Sensor Strength versus Azimuth (SSAZ). The SSAZ display consists of three concentric bands extending from an inner circle. Each band represents data from a different Akula sensor. The innermost band, displays contacts detected on the conformal array. The second, or middle band, displays towed array contacts while the outermost band displays contacts on the cylindrical array.

NOTE: The towed array must be deployed before any contacts can appear in the Towed Array band on the SSAZ Display.

The 360-degree Bearing Indicator rims the outer edge of the Circular Display. A narrow speckled ring near the inner edge of each band indicates background noise on that sensor. Contacts on the arrays appear as spikes emerging from the background noise at a specific bearing and extending toward outer edge of the band; the stronger the signal, the taller the spike.

Clicking inside a specific band selects that array. The outer edge of that band brightens and enlarges slightly indicating that the band and the array it displays is selected and the name of the selected array appears in the Array window just below the SSAZ display.

On the SSAZ Display, a thin line extending from the center to the outer edge represents Ownship. The line ends with an arrow indicating the direction Ownship's bow is pointing.

Each sensor display has its own cursor. A cursor appears as a short line extending into the array from each array's outer edge. Click inside the array to move the cursor to that location on that array's bearing indicator or click the cursor and drag it to a new location. The cursor is used to identify the contact you want to mark.

NOTE: There are no numbers on the bearing Indicators for the inner arrays. You must refer to the numbers on the outer edge of the display.

Ship speed greatly interferes with the ability of the Akula's sensors to detect and display contacts. Excessive speed results in the inability to detect any contacts at all. Only background noise is visible and that appears as a thick, jagged band at the outer edges of each array.



Background noise

ASSIGNING TRACKERS

1. Select the sonar array you want to view in the broadband display.

Sea wolf:

- Click **SELECT ARRAY**.
- From the resulting button matrix click **SPHERE** or **TOWED**.
- Click **BACK**.

688(I):

- In the Selected Array panel click the desired button. The button at the bow of the submarine graphic represents the sphere array. The button aft represents the towed array.

Akula:

- Click inside the desired circle to select that array. Outer: Cylindrical, Middle: Towed Array, Inner: Conformal array.
2. Click the desired contact line. A vertical cursor appears on the bearing indicator. You can click and drag this cursor along the bearing indicator.

Sea wolf:

- Click an orange Contact line.

688(I):

- Click a green Contact line.

Akula:

- Click a spike extending toward the outer edge of the selected array.

3. Click the appropriate button to designate the target and assign a tracker. (If the signal is faint, you may have to click more than once.)

Sea wolf:

- Click **ASSIGN TRACKER**.

688(I):

- Click **DESIGNATE TARGET**.

Akula:

- Click **TRACK ASSIGN**.

- A tracker letter is placed above the contact line on Seawolf and 688(I) or below the spike on Akula. Four trackers are available for each sonar array.

A, B, C, and D: Spherical/cylindrical contacts.

E, F, G, and H: Hull/conformal contacts. (These trackers can only be assigned in Narrowband on the Seawolf and 688(I) submarines. On the Akula they can be assigned in both broadband and Narrowband.)

I, J, K, AND L: Towed array contacts.

- If the sphere/cylindrical array already has four contacts assigned to trackers (A-D) and you designate a new contact, the oldest tracker is unassigned from its current contact and reassigned to the new contact. This is also true for the hull and towed arrays. To unassign a specific tracker, click on the letter and drag it into the Display and release it.
- Each contact you designate is assigned a sequential *Sierra* number: S01, S02, S03, etc. The Sierra number, also called a Contact ID or Track ID, and all available data on the contact are automatically sent to TMA and the Nav map.

TOWED ARRAY CONTACTS

Unless the towed array is deployed, no contacts will appear in Display when that sensor is selected. Towed array contacts do not appear immediately when you deploy the array. If the towed array is not already deployed at the beginning of the mission, you can stream it from the Ship Control Station.

Because of the way the towed array processes signals, an ambiguous contact, a mirror image of each true contact, appears on the display along with the true contact. If you have a contact at the same bearing on your bow array, you can be fairly certain a contact at the same or nearly the same bearing on your towed array display is the contact's true bearing.

If the contact is not visible on the bow array, changing the course of Ownship allows you to determine which contact is the actual and which is its mirror image on the display. After you maneuver, one contact remains at a consistent bearing and one appears to move in the display. The contact's true bearing is the contact that remains constant.

When numerous contacts are present or the contacts are close together, this process can be very challenging!

NOTE: Be aware that when you turn Ownship your towed array does not begin to turn until it reaches the point in the ocean where the ship began its turn. As a result, Ownship appears as a contact on the towed array during turns.

SEAWOLF: BROADBAND STATION



The Waterfall Display and the Sonar Station Selection buttons are described above. The Broadband Data Display and the Button Matrix are described here.

Seawolf Broadband Data Display

Cursor, contact and tracker information is displayed here. (The cursor is the vertical line above the bearing indicator in the waterfall display. Click the Bearing Indicator to move the cursor to that point or click the cursor and drag it to move it along the Bearing Indicator.)

Crsr Brg: Indicates the bearing at the location of the cursor or of the tracker when a tracker is selected with the Tracker Review button.

Sensor: Indicates which sensor is currently selected: Sphere or Towed.

Tracker: Displays the tracker letter assigned to the selected contact.

Contact: Displays the Contact ID assigned to the selected tracker or contact.

WAA RNG: When the cursor is over a broadband contact and a WAA range can be determined for that contact, the range to the contact displays in this field.

- Seawolf's Wide Aperture Arrays (WAA) can provide limited range information for contacts within 15,000 yds of Ownship if acoustic conditions in the area are favorable.

SNR: Displays the Signal to Noise Ratio at the location of the cursor. SNR indicates the strength of the signal.

Seawolf Broadband Button Matrix

Display Center: Displays button options for setting the center of the waterfall display to North (000 degrees) or South (180 degrees).

Select Array: Displays button options for selecting which sensor data will be displayed in the waterfall: Towed or Sphere.

Assign Tracker: Clicking here assigns a tracker to the contact at the location of the cursor.

Tracker Review: Displays contact information in the Data Display for each assigned tracker. Repeated clicks cycles through all trackers.

RAP LOC: Rapid Localization. Clicking this button sends any available WAA range information on the selected sonar contact to TMA. A tracker must be assigned to the contact. The range information appears on the next TMA bearing line for the contact.

- Seawolf's Wide Aperture Arrays (WAA) can provide limited range information for contacts that are within 15000 yards when conditions permit.

Audio: Displays buttons to toggle the broadband audio on and off. When ON, the sound produced by a broadband contact is audible when it is selected in the Broadband Display.

Time Scale Top: Displays button options for setting the time average in the upper Waterfall Display: Select STA, ITA, LTA (see below).

Time Scale Bottom: Displays button options for setting the time interval in the bottom Waterfall Display: Select STA, ITA, LTA (see below).

- STA = Short Time Average

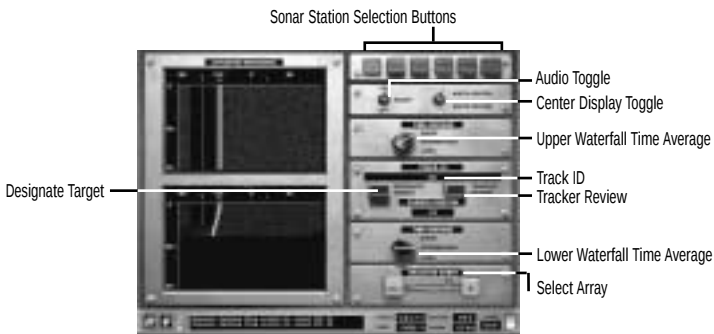
- ITA = Intermediate Time Average

- LTA = Long Time Average

Sonar Selection Buttons: Click the button of the sonar station you want to visit. Hold your cursor over a button to display the name of the station it represents.

688(I): BROADBAND STATION

688(I)'s Broadband Station is shown below.



Sonar Station Selection Buttons: Click the icon button of the sonar station you want to visit. Hold your cursor over a button to display the name of the station it represents.

Audio Toggle: When ON a cursor placed on a sonar contact emits the sound produced by the contact. When OFF no sound is emitted.

Center Display Toggle: When North Centered is selected the waterfall display is centered at 000 degrees. When South Centered is selected the waterfall display is centered at 180 degrees.

Upper Waterfall Time Average: Select the time average setting for the upper waterfall display. Click the text of the word that describes the desired setting: Short, Intermediate or Long.

Track ID: Displays the alphanumeric Track ID of the selected track.

Designate Target: To place a tracker on a contact and assign a Track ID (Sierra number) click the contact in the waterfall display then click Designate Target. The Sierra number (S01, S02, S03, etc.) is assigned to the contact, and the sensor data is sent to TMA.

Tracker Review: Click this button to cycle through all assigned trackers. The Track ID, also known as the Sierra number or Contact ID, is displayed in the Track ID field.

Cursor Position: Indicates the bearing at the location of the vertical cursor in the Bearing Indicator section of the waterfall display or cursor location of the tracker when a tracker is selected with the Tracker Review button.

Lower Waterfall Time Average: Select the time average setting for the lower waterfall display. Click the text of the word that describes the desired setting: Short, Intermediate or Long.

Select Array: The two buttons represent the sphere sensor (in the bow) or the towed array (aft). Click the desired button to display that sensor's input in the waterfall display.

AKULA: BROADBAND STATION

The interiors of both the Akula-I Improved and the Akula-II are the same in Sub Command. For simplicity, both of these interfaces will be referred to as Akula in this manual.



The Akula Broadband Station buttons and fields are described below.

Broadband Display: This Sound Signal versus Azimuth display (SSAZ) shows contacts from the Akula's cylindrical, towed and conformal arrays and allows for marking these contacts. See *Sonar Stations/Akulas: Circular SSAZ Display* on p. 63 for a full description of this display followed by directions for assigning contacts in this display.

Audio: Toggles Contact Sound ON and OFF. When ON placing the cursor on a contact in the SSAZ display emits only the sound generated by that contact. Defaults to ON.

Tracker: Displays the tracker letter for a contact you select on the display if it has a tracker assigned or for the contact selected when Cycle Contacts is clicked.

Cursor Bearing: Displays the bearing at the selected cursor location or the bearing of a tracked contact when Cycle Contacts is clicked.

Signal to Noise Ratio: Displays the signal to noise ratio at the location of the cursor.

Cycle Contacts: Click this button repeatedly to cycle through all assigned trackers in the selected array. Information on the selected tracker displays at the left of the screen in the Tracker, Cursor Bearing and Signal to Noise fields as well as in the Track ID field below the SSAZ display.

Array: Displays the name of the array selected in the SSAZ display.

Track ID: Displays the Sierra number (Contact ID) of the the contact at the location of the cursor if it has been assigned an ID or the ID of the tracker selected when Cycle Contacts is clicked.

Assign Track: When the cursor is on a contact in the selected array, click this button to assign a tracker to the contact and send all sonar information to TMA.

Sonar Station Selection Buttons: Click the appropriate button to move to that Sonar Station. See *Sonar Station Selection Buttons* on p. 59.

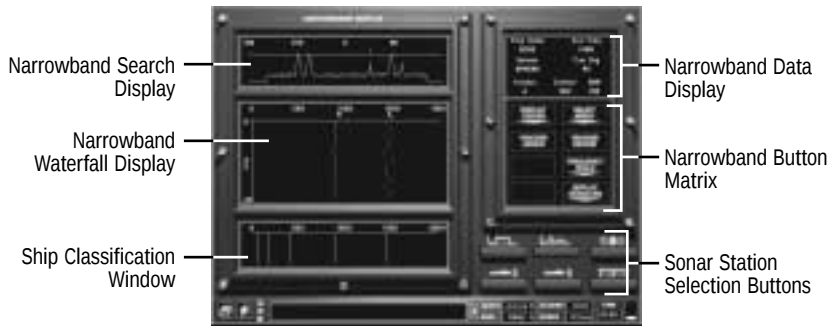
NARROWBAND SONAR



Each ship class has a unique sound frequency signature. The Narrowband function is used to classify sonar contacts by comparing the frequency signature of the selected contact against a database of known frequency signatures.

Regardless of which sub you are commanding, the ship's computer narrows your search by presenting only those signatures that have similarities to the signature of the selected contact. Each sub's Narrowband Station is covered separately below.

SEAWOLF: NARROWBAND SONAR



Narrowband Search Display: On the Narrowband Search Display signals from the selected array display in an A-scan format. A contact's signal displays as a spike at the bearing where it is detected. The height of the spike represents signal strength. High peaks indicate strong signal strength.

NOTE: Ownship's speed can affect your ability to detect contacts in Narrowband. When the entire signal line is near the top of the display this indicates that background noise is very high. This usually happens when your speed is over 5 kts for hull array contacts or over 15 kts for towed array contacts. Decrease your speed to reduce water flow over the array.



Narrowband Waterfall Display: The Narrowband Waterfall Display separates a signal from the bearing selected in the Narrowband Search Display into discrete frequencies. The horizontal axis represents the range of frequencies and the vertical axis represents time in seconds. The frequency range is adjustable using the frequency scale as described below. Vertical lines represent specific frequencies in the sound signal emitted by the selected contact. Together all of the frequency lines represent that contact's sonar signature.

NOTE: Straight lines indicate a consistent signal. Curved or wavy vertical lines represent distortions or variations in the signal.

Ship Classification Window: This window displays the sound signature of the class or weapon named in the Profile Selector. Click **DISPLAY SIGNATURE** in the Button Matrix to access the Profile Selection Panel and the Profile Selector. See Display Signature in the Narrowband Button Matrix section below.

Seawolf Narrowband Data Display

Frequency Scale: Displays the frequency range currently viewed in the Narrowband Waterfall Display and the Ship Classification Window. This range is selected using the Frequency Scale button in the Narrowband Button Matrix.

Cursor Frequency: Displays the precise frequency of the signal selected in the Narrowband Waterfall Display.

- To select a signal, click the desired line in the Narrowband Waterfall display. The cursor moves to that location in the Horizontal Frequency Display and the frequency at the cursor location displays in this field.

Sensor: Displays the name of the selected array. Use the Select Array button in the Button Matrix to select a different sensor.

Cursor Bearing: Displays the location of the cursor on the bearing indicator at the top of the Narrowband Search Window.

Tracker: Displays the assigned tracker letter of the selected contact when the Tracker Review button is clicked on the Button Matrix.

Contact: Displays the alphanumeric ID (contact ID) of the contact selected when the Tracker Review button is clicked on the button Matrix.

SNR: Signal to Noise Ratio. This field displays the SNR of the selected contact. A high number indicates a strong signal.

Seawolf Narrowband Button Matrix

The Seawolf utilizes a button matrix on many ship stations. Buttons containing a down arrow display a second panel providing options related to the button text. Buttons with no down arrows perform the described function when clicked. Click Back to return to the previous matrix.

Display Center: Displays a panel for setting the center of the Narrowband Search Window to either North (000) or South (180).

Select Array: Displays a panel for selecting which sensor's signals are displayed in the Narrowband Search window. (Sphere, Towed, Hull.)

NOTE: The towed array must be deployed before any towed array signals can be detected. The Towed Array is deployed in the Ship Control Station.

Tracker Assign: Click to assign a tracker to the frequency line selected in the Narrowband Waterfall Display.

NOTE: If the signal is weak you may have to click more than once to designate the contact and assign the tracker. You cannot assign a tracker while the game is paused.

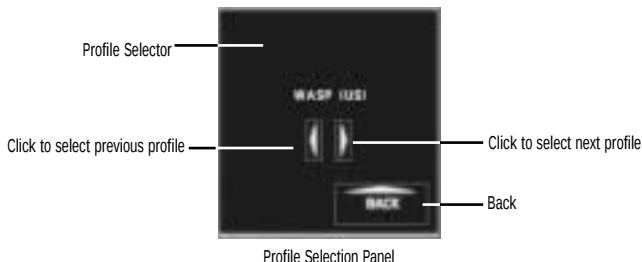
Tracker Review: Click this button to cycle through all trackers assigned in Narrowband. Information on each tracker is viewed in the Data Display in the Cursor Frequency, Cursor Bearing, Tracker, Contact, and SNR fields.

Frequency Scale: Displays a panel for selecting one the following frequency ranges: 0 to 2000 (default), 1000, 500, 300, 150 and 50.

Display Signature: Displays the Profile Selection Panel. See below.

Profile Selection Panel:

Your ship's computer queries its database and provides you with the ship classes and weapons that have signatures which include the currently selected narrowband lines. The names of these ship classes or weapons can be seen one at a time in the Profile Selector. The sound signature for the class named in the Profile Selector displays in the Ship Classification Window.



To classify the contact:

1. Select a contact in Narrowband search
2. Click the previous or next buttons to cycle through the available profiles.
3. Compare each ship's signature in the Ship Classification window to the signature of the selected contact in the Narrowband Waterfall display.

4. Click the Back button then the Frequency Scale button. Select a range to compare the frequencies in that range.
 5. When you find the profile that most closely matches the selected contact's sound signature, leave that name selected in the Profile Selector, and make a mental note of the contact's bearing.
- When you leave Narrowband Sonar the class name showing in the profile window is sent to the Contact menu's Classify Contact dialog available on the Nav map. Move to the Nav map to complete the classification process.

On the Nav Map

1. Select the symbol of the contact that you just identified in Narrowband.

NOTE: If the contact that you have classified in Narrowband has not yet been assigned a Contact ID (S1, S2 etc), a contact ID symbol does not exist for that contact on the Nav map. You can not complete the contact classification process on the Nav map until the contact has been assigned a Contact ID.

2. Right-click the symbol of the contact to display the Contact menu. Select Classify Contact to display the classification dialog. Select the class name determined in the Narrowband Profile Selector.

■ If you have just come from Narrowband, the last class name you left selected in the Narrowband Profile Selector is highlighted in the Class list when you select the same contact on the Nav map.

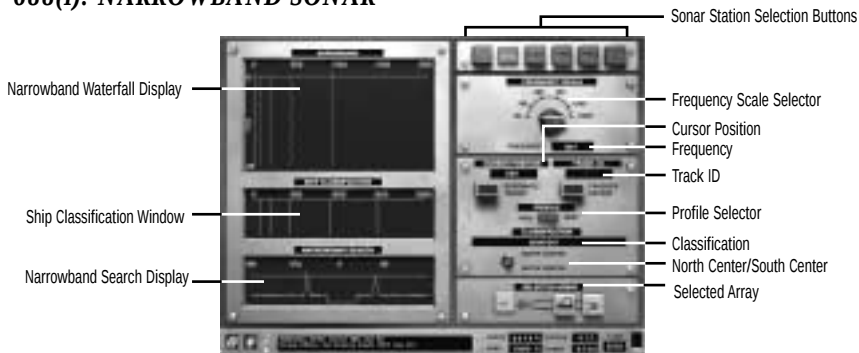
NOTE: You can classify contacts in ESM, Stadiometer and Narrowband. The Classification dialog highlights the name of the class that was most recently classified by one of these sensors whenever you select that contact on the Nav map.

3. Assign a level of confidence in your classification. Click **LOW**, **MEDIUM** or **HIGH**.
4. Assign an alliance to the contact. Click **ALLIED**, **THREAT**, **NEUTRAL** or **UNKNOWN**.
5. Click **OK**.

■ The classification you have assigned to the contact now appears in the Navigation Data Display and the 3D model of that class appears in the 3D view when that contact is selected on the Nav map.

Sonar Station Selection Buttons: Click the desired button to move to that Sonar Station.

688(I): NARROWBAND SONAR



Narrowband Waterfall Display: The Narrowband Waterfall display separates a signal from the bearing selected in the Narrowband Search Display into discrete frequencies. The horizontal axis represents the range of frequencies and the vertical axis represents time in seconds. The frequency range is adjustable using the frequency scale dial as described below. Vertical lines represent specific frequencies in the sound signal emitted by the selected contact. Together these lines represent that contact's sonar signature or profile.

NOTE: Straight lines indicate a consistent signal. Curved or wavy vertical lines represent distortions in the signal.

Frequency Scale: Use this dial to adjust the frequency scale to be used in the waterfall display.

- Click the desired number to switch to that frequency range in the waterfall display. The dial moves to indicate the frequency selected.

Frequency Window: Displays the precise frequency of the selected signal.

- To select a signal, click the desired line in the Narrowband Waterfall display. The cursor moves to that location in the horizontal frequency indicator.

Designate Target Button: Assigns a designation to a contact. This alphanumeric reference is used to track, identify and target contacts. A tracker is assigned to the designated narrowband contact.

To designate a contact and assign a tracker:

1. Click one of the vertical frequency lines in the Narrowband Waterfall Display. The vertical cursor appears on the bearing indicator at the location of the line. The cursor can also be dragged.
2. Click **DESIGNATE TARGET**. A letter appears on the bearing indicator, and an alphanumeric tag appears in the Track Identification window. Tracking data is sent automatically to TMA. Assigning a tracker here may unassign a tracker from a contact in broadband if all trackers are currently assigned.

NOTE: If the signal is weak you may have to click more than once to designate the contact and assign the tracker. You cannot assign a tracker while the game is paused.

Ship Classification Window: This window displays the sound signature of the class or weapon named in the Classification field. Use the Profile Selector to cycle through the available signatures.

Profile Selector: The ship's computer compares the sonar signature in the Narrowband Waterfall display against those in its sound profile database. Only those signatures that are similar to that of the selected contact are presented for review.

- Click **PREV/NEXT** to view the signature profiles for all ships or weapons that are similar to the profile of the selected contact.

Cursor Position: This field displays the precise bearing of the cursor on the Narrowband Search Display.

- To read the exact bearing of a contact, click the contact spike or click the horizontal Bearing Indicator on the Narrowband Search Display and drag the cursor to the desired position.

Track ID: The alphanumeric Track ID, also called Contact ID, displays in the Track Identification window when a tracker is designated in the Waterfall Display.

North Center/South Center: Toggle to change the orientation of the Narrowband Search display.

- Select North Centered to place the bearing 000 at the center of the Narrowband Search Display.
- Select South Centered to place the bearing 180 at the center of the Narrowband Search Display

Narrowband Search Display: Signals from the selected array display in an A-scan format on the Narrowband Search Display. A contact's signal displays as a spike at the bearing where it is detected. The height of the spike represents signal strength. High peaks indicate strong signal strength.

To select a signal in Narrowband Search Display:

Click the peak of a signal. (You can drag the cursor left/right to search for signals.) The sound signature of that signal is sent to the Narrowband Waterfall Display where it appears as lines.

Straight lines indicate a consistent signal. Wavy lines indicate that the signal is distorted. Faint lines indicate a weak signal.

NOTE: Ownship's speed can affect your ability to detect contacts in Narrowband. When the entire signal line is near the top of the display this indicates that background noise is very high. This usually happens when your speed is over 5 kts for hull array contacts or over 15 kts for towed array contacts. Decrease your speed to reduce water flow over the array.

Classifying the contact

Match the frequency lines in the Waterfall Display with the frequency lines in the Ship Classification window. Cycle through each of the profiles selected from the ship's database of sound signatures to determine the closest match.

1. Click **NEXT** or **PREVIOUS** to view the sound signature named in the profile selector in the Ship Classification window.
2. Adjust the frequency range to better see distinct ranges.
3. When you decide which ship's signature best matches that of the selected contact, simply leave that class name selected in the Classification window, make a mental note of the bearing of the contact and leave the Narrowband Station.

That class name last selected in the Narrowband Profile Selector is sent to the Contact menu's Classify Contact dialog available on the Nav map.

On the Nav Map

1. Select the symbol of the contact that you just identified in Narrowband.

NOTE: If the contact that you have classified in Narrowband has not yet been assigned a Contact ID (S1, S2 etc), no contact ID symbol exists for that contact on the Nav map. You can not complete the contact classification process on the Nav map until the contact has been assigned a Contact ID.

2. Right-click the symbol of the contact to display the Contact menu. Select Classify Contact. Select the class name determined in the Narrowband Profile Selector.
- If you have just come from Narrowband, the last class name you left selected in the Narrowband Profile Selector is highlighted in the Class list when you select the same contact on the Nav map.

NOTE: You can classify contacts in ESM, Stadiometer and Narrowband. The Classification dialog highlights the name of the class that was most recently classified by one of these sensors whenever you select that contact on the Nav map.

3. Assign a level of confidence in your classification. Click **LOW**, **MEDIUM** or **HIGH**.
4. Assign an alliance to the contact. Click **ALLIED**, **THREAT**, **NEUTRAL** or **UNKNOWN**.
5. Click **OK**.

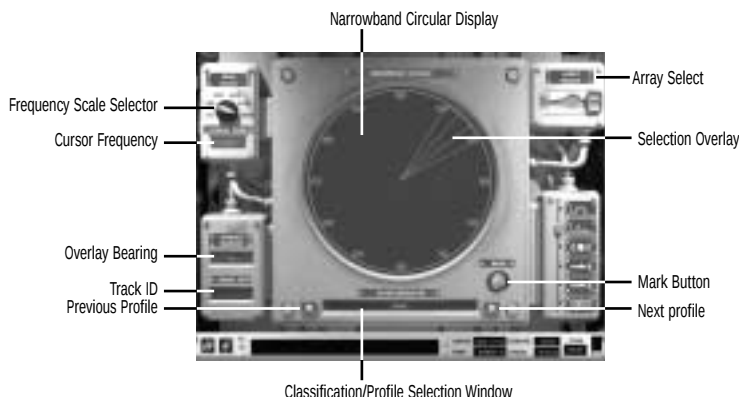
■ The classification you have assigned to the contact now appears in the Navigation Data Display and the 3D model of that class appears in the 3D view when that contact is selected on the Nav map.

Selected Array: Select the array you want to view in the Narrowband Search Display. Click Sphere, Hull or Towed icon button.

- Click the appropriate button. The button in the bow of the sub outline represents sphere, the button in the middle in represents Hull, and the aft button represents the Towed Array.

NOTE: The towed array must be deployed before any towed array signals can be detected.

AKULA: NARROWBAND SONAR



The buttons and interfaces of the Akula Narrowband Station are described below.

Narrowband Circular Display: The Akula's Narrowband Display is a Frequency vs. Azimuth (FRAZ) display. Lines seen on the FRAZ display represent signals received at given frequencies and bearings. Signals centered on a specific bearing are contacts. These can be selected with the Selection Overlay. The distance from the center of the display represents the frequency of the signal. The length of each line represents the bearings at which the same frequency signal is received. This length corresponds to the base of a peak on the broadband display.

Classification Window: The names of ship classes with sound frequency profiles similar to that of the selected contact's sound signature are presented one at a time in this window. When a class name is selected here, its sound profile is displayed on the outer wedges of the selection overlay when a contact is selected on the circular display. See *Selection Overlay* below.

Left Arrow/Right Arrow: Clicking on these arrows moves backward and forward through the list of available profiles in the Classification window.

Array Select: Selects which array's signals are displayed in the FRAZ display. The cylindrical button is on by default and located on the bow of the sub outline. The conformal button is in the middle of the outline and the Towed Array button at the rear of the submarine outline.

- Click the desired rectangle to select that array. A raised ridge appears around the rectangle of the selected array.

Frequency Scale: Frequency scale on the FRAZ display runs from the center to the outer edge where the center is zero and the outer edge is whatever scale is selected on the Frequency Scale selector dial. The default frequency range is zero to 2000.

- Click the desired number to switch to that frequency range in the circular display. The dial moves to indicate the frequency selected.

Cursor Frequency: Displays the frequency at the location of the cursor.

- Click the FRAZ display to see the frequency at that location in the display in the Cursor Frequency window.

Overlay Bearing: Displays the bearing at the exact center to the Selection Overlay.

Track ID: Clicking on a frequency line that has been assigned a tracker displays the alphanumeric designation for that contact in this window.

Selection Overlay

The Selection Overlay acts as a cursor for selecting and designating contacts and for displaying the sound signature profiles of ships or weapons with similar signatures.

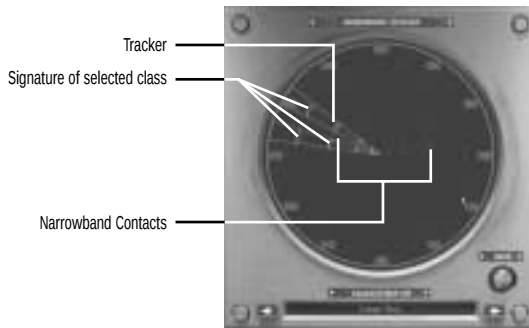
An imaginary line through the exact center of the wedge is the precise bearing indicator and its position on the circular display is seen in the Overlay Bearing window.

The Selection Overlay is divided into three parts or wedges. The center wedge is used to select contacts. Position the center section over a contact to select it.

- Click the overlay and drag it to the desired location.

- Clicking on any point on the circular display centers the selection indicator at that location.

When a contact is selected, the outer wedges display the sound signature for whatever ship class or weapon is selected in the Classification window. When no contact is selected nothing appears in the outer wedges.



To designate a contact and assign a tracker:

1. Select a contact by dragging the wedge shaped selection overlay and positioning the center section over the contact. To move the overlay, click the edge of the overlay and drag it to the desired location.
2. Place your cursor on one of the selected contact's frequency lines inside the wedge and click to select it. Click **MARK**. You may have to click several times if the signal is weak. A tracker letter appears near the frequency line and the contact's alphanumeric track ID appears in the Track ID window when the frequency line is selected.

To classify a contact:

When a contact is selected, its sound signature displays in the center wedge of the Selection overlay and the sound signature profile of the ship class named in the Classification window appears in the outer wedges of the selection overlay.

1. Compare the frequency lines of the selected contact in the center to that of the profile in the outer wedges.
2. Adjust the Frequency Scale Dial to see distinct ranges more clearly.

3. Click **PREVIOUS** or **NEXT** to view any other profiles that your ship's computer has selected from the profile database.
4. When you decide which profile most closely matches that of the selected contact, leave that class name in the Classification window and make a note of the Track ID or bearing of the contact.
5. Go to the Nav map to complete the classification process.

On the Nav Map:

1. Select the symbol of the contact that you just identified in Narrowband.

NOTE: If the contact that you have classified in Narrowband has not yet been assigned a Contact ID (S1, S2 etc), a contact ID symbol does not exist for that contact on the Nav map. You can not complete the contact classification process on the Nav map until the contact has been assigned a Contact ID.

2. Right-click the contact's symbol to display the Contact menu. Select Classify Contact to display the Classification dialog.

■ If you have just come from Narrowband, the last class name you left selected in the Narrowband Profile Selector is highlighted in the Class list when you select the same contact on the Nav map.

NOTE: You can classify contacts in ESM, Stadiometer and Narrowband. The Classification dialog highlights the name of the class that was most recently classified by one of these sensors whenever you select that contact on the Nav map.

3. Assign a level of confidence in your classification. Click **LOW**, **MEDIUM** or **HIGH**.

4. Assign an alliance to the contact. Click **ALLIED**, **THREAT**, **NEUTRAL** or **UNKNOWN**.

5. Click **OK**.

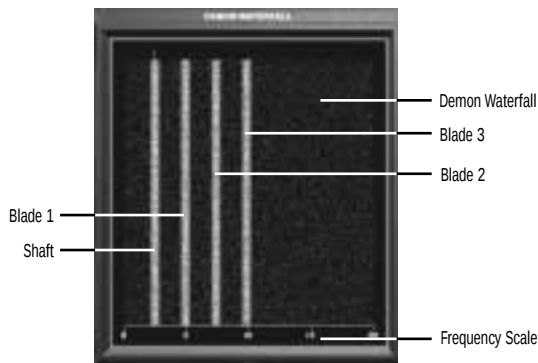
■ The classification you have assigned to the contact now appears in the Navigation Data Display and the 3D model of that class appears in the 3D view when that contact is selected on the Nav map.

DEMON SONAR STATION



DEMON is an acronym for Demodulated Noise. The DEMON function is used primarily to determine the contact's speed. This is important information when establishing an accurate firing solution and once determined here the value can be entered in the speed field in your TMA solution. While DEMON cannot help you establish the specific class of a contact, it can help you narrow in on the type of platform that is selected. See *Classification using DEMON* later in this chapter.

The main component of the DEMON Station is the DEMON Waterfall Display. The waterfall display separates the selected signal into demodulated components. On the display, the horizontal axis represents frequency and the vertical axis represents time. When a contact is selected its signal appears as parallel vertical lines in the waterfall. The number of lines that appear depends on the number of propeller blades the contact has. The line farthest left represents the shaft speed. Each line to the right of the "shaft" line represents one propeller blade. The Seawolf DEMON Waterfall Display is seen here. The DEMON waterfall functionality is the same on all controllable subs.



To determine a contact's speed accurately, you must have classified the contact in Narrowband, ESM or Periscope. The number of turns per knot produced by a specific class is listed in the USNI Information for that class. The steps for using DEMON to determine a contact's speed and how to use DEMON to determine a contact's type are shown below. The DEMON Station Interface and button description for each sub class follows the instructions.

To calculate the contact's speed:

1. Select the desired array.

Seawolf:

- Click **SELECT ARRAY**. A panel containing array buttons appears. Select the desired array. The selected button is green. Click **BACK**.

688(I):

- At the bottom of the station, click the desired sensor button on the submarine outline below the Selected Array label. The button in the bow selects the Sphere Array. The aft button selects the Towed Array.

Akula:

- Click the desired sensor button in the submarine outline under the Array Select label. The pink button in the bow selects the Cylindrical Array. The aft button selects the Towed Array. A raised ridge rims the selected button.

2. **Select the contact you want to analyze.** (Sonar trackers must be assigned to contacts in Broadband before they are available in DEMON.) To select a contact:

Seawolf:

- Click **TRACKER REVIEW** until the Contact ID and tracker letter for the desired contact appear in the DEMON Data Display.

688(I):

- Under Available Trackers click the blue button associated with the desired contact.

Akula:

- Under DEMON Display click the round silver button associated with the desired contact. A red ring around the button indicates that button is selected.

NOTE: If the game is paused, no lines appear in the waterfall display.

3. If necessary, adjust the frequency to better view the signal. If the lines in the display seem to blur together, switch to a lower frequency range. If the lines run off the right edge of the display, increase the frequency range. To adjust the frequency range:

Seawolf:

- Click **FREQUENCY SCALE** in the button matrix. A panel with frequency options appears.
- Click the desired scale.
- Click **BACK**.

688(I):

- Under Frequency Scale click the number of the desired frequency scale. The dial turns to the selected number.

Akula:

- Under Freq. Scale click the number of the desired frequency scale. The dial turns to the selected number.

4. **Set the Turns Per Knot (TPK) for the known target.** The TPK for all ships in the game can be found in the U.S. Naval Institute reference file for the platform. To set Turns Per Knot and determine contact's speed:

Seawolf:

- Place the waterfall cursor over the line farthest left.
- Click **TURNS PER KNOT** in the button matrix.
- In the panel that appears, click either **INCREASE T.P.K.** or **DECREASE T.P.K.** as necessary to set the desired TPK value. The selected value is seen in the Data Display in the Turns Per Knot field. The speed for the designated TPK is displayed in the Speed field in the Data Display.

688(I):

- Place the waterfall cursor over the line farthest left. Click the blue Turns Per Knot switch repeatedly to set the desired value for the known contact. The speed for the designated TPK displays in the Speed field.

Akula:

- Place the waterfall cursor over the line farthest left.
- Click the **+** or **-** buttons in the Turns Per Knot panel to set the desired value for the known contact. The speed of the target appears in the Speed field below the buttons.

When you have determined the speed of the contact, enter that speed in the TMA display for the selected contact.

Using DEMON to determine a class type

By determining the number of blades on a contact's propeller, listening to the sounds it emits and observing the contact's behavior you can make an educated guess as to the contact's type.

1. Select a sonar array as described above.
2. Select a sonar contact by clicking on a tracker button as described above. Vertical lines appear in the waterfall. The first line on the left indicates the shaft rotation speed. The other lines indicate individual blades on the propeller.
3. If necessary, adjust the frequency scale until the lines display clearly and individually on the waterfall.

Use the following criteria to classify the selected contact:

Merchant Vessels/Tankers: Typically three or four blades; noisy; often maintains predictable course.

Warships: Typically four or five-bladed propellers; quieter, smoother sound than merchant ships; possibly unpredictable course changes.

Submarines: Five or seven-bladed propellers; very quiet when submerged and at low speed; unpredictable course changes.

Fishing Vessels/Trawlers/Pleasure Craft: Three- or four-bladed propellers; noisy; erratic courses and speeds, frequently stopping and starting.

NOTE: Turns per knot for military and civilian ships are found in USNI Reference. Click **CIVILIAN** in the Country column then the name of the ship type to find TPK information on Civilian ships.

SEAWOLF DEMON DISPLAY



Seawolf's DEMON Data Display and Matrix buttons are described below. Instructions for using The DEMON function are found above.

Seawolf DEMON Data Display

Turns Per Knot: Displays the number of turns set using the Turns Per Knot button in the DEMON button matrix.

Speed: Displays the speed of the contact as calculated using the Turns Per Knot button in the DEMON button matrix.

Tracker: The tracker letter of the selected contact appears in this field when the Tracker Review button is clicked in the DEMON button matrix.

Contact: The alphanumeric Contact ID displays in this field when the Tracker Review button is clicked in the DEMON button matrix.

Csr Frequency: Displays the frequency at the location of the cursor in the DEMON waterfall display.

Bearing: Displays the bearing of the selected contact when the Tracker Review button is clicked in the DEMON button matrix.

SNR: Signal to Noise ratio of the selected contact.

Seawolf DEMON Button Matrix

Select Array: Displays a panel for selecting which sensor's signals are displayed in the DEMON Waterfall when the Tracker Review is clicked. (Sphere or Towed.)

Tracker Review: Clicking this button cycles through the contacts that have trackers assigned in the Broadband Station. Contact information displays in the DEMON Data Display in the Tracker, Cursor, Bearing and SNR fields.

Frequency Scale: Displays a panel for selecting the frequency scale in use in the DEMON Waterfall. (20, 50 or 120)

Turns Per Knot: Displays a panel for adjusting the Turns Per Knot setting for the selected contact. (Increase T.P.K. and Decrease T.P.K.)

688(I) DEMON DISPLAY



Directions for using the DEMON display start on p. 78. Here the 688(I) DEMON station buttons are described.

Available Trackers: The trackers assigned in Broadband appear in these fields. If no trackers are assigned in Broadband for the selected array, nothing appears in the tracker fields or the waterfall.

- Click blue button associated with the desired track to analyze that contact's signal in the DEMON waterfall.

DEMON Waterfall: The signal from the selected contact with the Available Tracker button is broken into its demodulated components. The selected frequency range scale is seen at the bottom. A vertical line cursor appears above the waterfall. The cursor can be dragged

Sonar Station Selection Buttons: Click the appropriate button to switch to that sonar station. Hold your cursor over a button to display the name of the station reached by selecting that button.

Frequency Scale: Selects the frequency scale to use in the waterfall. Click the desired number to switch to that frequency scale. The dial moves to that position.

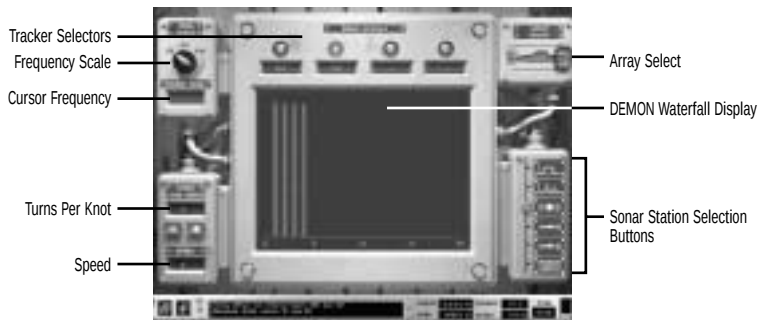
Cursor Frequency: Indicates the frequency at the location of the vertical cursor in the waterfall display.

Turns Per Knot: Click the blue switch (+ to increase or – to decrease the number) to set the known turns per knot of the selected contact in the Turns Per Knot window. (You must classify the contact in Narrowband, ESM, or Periscope then look up the USNI information on that class to determine the correct turns per knot value to enter here.)

Speed: The speed for the selected contact displays here when the cursor is placed on the line farthest left in the waterfall and the accurate number of turns per knot for that ship class is entered in the Turns Per Knot window.

Selected Array: Select Sphere or Towed to make the signals from that array available in the Available Tracker fields.

AKULA DEMON DISPLAY



Directions for using the DEMON Display start on p. 78. Here the Akula's DEMON station buttons are described.

Tracker Selectors: These silver buttons are used to select which contact's data is displayed in the waterfall. Click the button associated with the Contact ID you wish to analyze. The selected button is rimmed in red. (If no trackers are assigned in Broadband no Contact IDs appear in these fields.)

Array Select: Select the aft button for Towed or the bow button to place contacts from the cylindrical array in the tracker fields.

Sonar Station Selection Buttons: Click the desired button to switch to that sonar station. Place your cursor over a button to display the name of that station.

Frequency Scale: Selects the frequency scale to use in the waterfall. Click the desired number to switch to that frequency scale. The dial moves to that position.

Turns Per Knot: Click the red + button to increase or the red – button to decrease the value displayed in the Turns Per Knot window. (You must classify the contact in Narrowband, ESM, or Periscope then look up the U. S. Naval Institute information on that class to determine the correct turns per knot value to enter here.)

Speed: The speed for the selected contact displays here when the cursor is placed on the line farthest left in the waterfall and the accurate number of turns per knot for that ship class is entered in the Turns Per Knot window.

ACTIVE SONAR STATION



MEDIUM FREQUENCY (MF) ACTIVE SONAR

The spherical/cylindrical array in active mode is used to detect and track contacts. Echoes from a single ping or a series of pings are used to determine an object's bearing and range. Information from a medium frequency active search is sent to the TMA station for use in plotting a firing solution for the given contact. While this information is very useful to you, it comes at a price. Using active sonar gives away your bearing and alerts any ship in the area to your presence. The ship may well assume you have hostile intentions since active sonar is used primarily for targeting.

HIGH FREQUENCY ACTIVE SONAR (HFAS)

High Frequency active sonar (HFAS) has a shorter range and can detect smaller objects than medium frequency active sonar. When you must navigate a minefield, HFAS can be used to locate and mark mines near your ship. Once a mine is located, maneuver quickly to avoid it by the largest possible margin. Driving slowly will give you the best reaction time. Marking the mines helps you keep track of the location of the mines should you need to traverse the field again when you leave the area. One method to find a safe route is to follow another ship's path. HFAS is also useful for avoiding dangerous ice ridges during under ice operations.

A single ping is not appropriate for mine avoidance therefore high frequency active sonar transmits continuous pings. Always keep in mind that many ships and submarines can detect any active sonar transmissions.

USING MEDIUM FREQUENCY ACTIVE SONAR

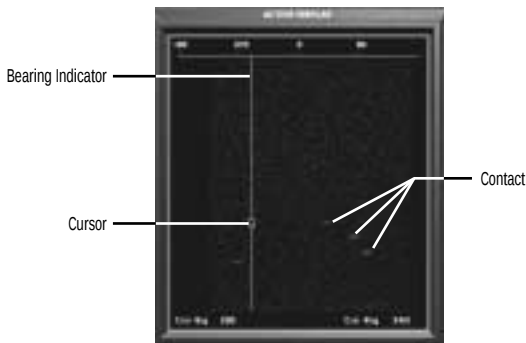
Instructions for using the Active Sonar Displays are described below. A description of the buttons and fields on the Active Stations for all controllable subs follows the instructions.

Regardless of the shape of the display, the Active sonar works the same way on all controllable subs. Seawolf and 688(I) class subs have a rectangular display while the Akula's active display is circular.

The display shows the results of active sonar echo ranging. Speckled areas represent echoes from the ocean background, reverberation, in general. The area of blank space represents the area behind your ship, active sonar baffles. Since the signals transmitted from your bow array cannot reach the area behind your ship, no echoes are returned from that area.

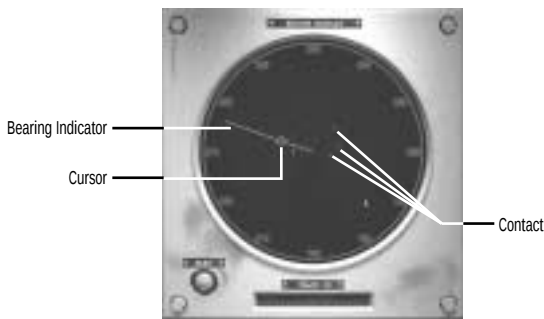
SEAWOLF AND 688(I): MF ACTIVE SONAR DISPLAYS

The area at the bottom of the Active Display represents objects closest to your ship. The horizontal line at the top represents bearing. The display updates from the bottom up. Each subsequent ping replaces the oldest data with the newest. The Seawolf's Active Display is seen below.



AKULA: MEDIUM FREQUENCY ACTIVE SONAR DISPLAY

In the Akula's circular display the area closest to the center represents objects closest to your ship. The circle represents bearing. The screen updates from the center out. Each subsequent ping replaces the oldest data with the newest. The Akula's Active Display is seen below:



ACTIVE SONAR CONTACTS

Contacts appear as bright spots on the active display. A metallic ring is heard as each contact displays. The active display shows a four-ping history, which is useful in detecting contacts with weak signal strength

The **cursor** in the active display consists of a circle (in the Akulas) or a square (in both the Seawolf and 688(I) class subs) attached to a vertical line that indicates a specific bearing. The distance of the cursor from the center of the circle or the bottom of the display represents its range from Ownship. The position of the vertical line on the Bearing Indicator represents the bearing of the cursor. To move the cursor, click the square (or circle) and drag it to the desired location on the display.

To Determine a Contact's Bearing and Range:

- Drag the cursor to center it over a contact.

Seawolf:

- The contact's bearing and range appear directly below the active display in the Crsr Brg and Crsr Rng fields. Range is given in yards.

688(I):

- The contact's range and bearing display in the Range/Bearing Control area of the screen in the Yds and Deg fields. Range is given in yards.

Akula:

- The contact's range and bearing display in the lower right of the screen in the Range (M) and Bearing windows. Range is given in meters.

To track a contact with Active Sonar:

1. Select a Range Scale. Longer Range Scales are appropriate for initial search. Once a contact is detected, you can adjust the Range Scale of subsequent pings in order to get higher resolution and accuracy. Selecting a new range halts continuous transmissions. You must click transmit again to resume transmissions.

Seawolf:

- Click **RANGE SCALE** on the Active Sonar button matrix.
- In the panel that appears, click the button of the desired range. The numbers indicate thousands of yards.
- Click **BACK**.

688(I):

- Click the number of the desired range on the Range Scale (KYDS) selector. The dial moves to the indicated position and the selected range scale is implemented in the Active Display. The numbers indicate thousands of yards.

Akula:

- Click the number of the desired range on the Range Scale (KM) selector. The dial moves to the indicated position and the selected range scale is implemented in the Active Display. The numbers indicate kilometers.

2. **Select transmission mode:** Single or Continuous pings. If Single is selected, only one active sonar ping is transmitted. When Continuous is chosen, active sonar pings are transmitted at a set interval until the switch is reset to Single or you change the range scale.

Seawolf:

- Click **TRANSMIT TYPE** on the Active Sonar Button Matrix.
- In the panel that appears click **SINGLE** or **CONTINUOUS** as desired. Green indicates the option is selected.
- Click **BACK**.

688(I):

- Click **SINGLE** or **CONTINUOUS** as desired in the Echo Ranging panel.

Akula:

- The Akula has separate buttons to transmit single or continuous pings. The button clicked in the next step determines transmission mode.

3. Transmit the signal.

Seawolf:

- Click **TRANSMIT** on the Active Sonar button matrix. The type of signal set in the previous step is transmitted.

688(I):

- Click **TRANSMIT** to send signals of the type selected in the adjacent toggle switch

Akula:

- Click either **TRANSMIT SINGLE** or **TRANSMIT CONTINUOUS** as desired. The designated type of signal is transmitted.

NOTE: To stop the transmission of continuous pings on any of the submarines, click again on the **TRANSMIT** button.

- 4. Conduct a thorough search.** For search purposes, multiple transmissions are required to determine whether or not contacts are present with any degree of certainty. A valid contact will give consistent visual returns that are brighter than background noise or reverberations. The audio return will have a distinctive metallic ring to it and will be distinguishable from the background noise.
- 5. Place cursor on target.** When a potential active return is seen on the display, position cursor by clicking and dragging it to position it on the target. Both the range and bearing of the potential contact will be displayed.
- 6. Mark target.** Click **MARK** to assign alphanumeric Contact ID to the selected contact. Once a selected contact has been marked once, selecting it and clicking Mark again sends an update of the contact's range and bearing to TMA and the Nav map.
- 7. Designate Target.**

Seawolf only:

This function assigns an alphanumeric Contact ID and a tracker to the contact. The tracker automatically sends updated information for the contact to TMA as long as there is a continuous active sonar transmission.

- Drag the cursor to position it over the contact then click **DESIGNATE TARGET** to assign a Contact ID and a tracker. The ID and tracker are not assigned until after the next ping.

NOTE: The spherical array has only four trackers. If you have all four trackers assigned in Broadband or Narrowband and designate a target in Active Sonar, the oldest tracker is removed from a Broadband or Narrowband contact for use in Active.

SEAWOLF: ACTIVE SONAR STATION

Instructions for designating a target using Seawolf's Medium Frequency Active Sonar are described in *Using MF Active Sonar* above. The use of Seawolf's High Frequency Active Sonar is described following a brief description of the Active Sonar Data Display and Button Matrix. By default medium frequency active sonar is selected in the Frequency options on the Button Matrix. Fewer options are available in the Button Matrix when High Frequency is selected.



Seawolf Active Sonar Data Display

Tracker: Displays the tracker letter of the selected contact when the (tracker) Review button is clicked in the button matrix.

Contact ID: Displays the Contact ID of the selected tracker when the (tracker) Review button is clicked in the button matrix.

Tracker Bearing: Displays the bearing of the contact that is assigned to the selected tracker when the (tracker) Review button is clicked in the button matrix.

Frequency: Displays the type of frequency selected with the Frequency button on the button matrix: Medium or High. Medium is selected by default.

Transmit: Indicates the type of transmission to be produced when the Transmit button is clicked: Single or Continuous. The type of transmission is selected with the Transmit Type button on the button matrix.

Seawolf Active Sonar Button Matrix

Display Center: Displays options for setting the center of the Active Display. Select North to center the display at 000. Select South to center the display at 180.

Frequency: Displays options for selecting either Medium or High frequency sonar emissions.

Designate Target: When the cursor is over a valid contact, clicking this button assigns a tracker to the contact and also assigns it an alphanumeric contact ID (S01, S02 etc.) Data on the contact is sent to TMA and the tracker automatically sends updates to TMA as they are received.

Review: Cycles through all assigned trackers. Information pertaining to the selected tracker appears in the Data Display.

Mark: Assigns a contact ID and sends data on the selected contact to TMA and the Nav map. No tracker is assigned.

- Ensure that the cursor is centered on the most recent return from the contact and click **MARK**. If you are in single ping mode it makes more sense to use the Mark function rather than the Designate Target feature so as not to waste a tracker.

Range Scale: Displays options for setting the maximum range in the Active Display. Numbers are in thousands of yards (5, 10, 20, 40, 80).

Transmit Type: Displays options for selecting the type of transmission you want to send: Single ping or continuous ping. Continuous transmissions continue to ping until you stop it. This selects only the type of transmission. It does not transmit the signal.

Transmit: Click to transmit a signal of the type selected with the Transmit Type Button. The type of transmission that is selected displays in the Transmit field in the Active Sonar Data Display. To stop a continuous ping, click Transmit, again.

SEAWOLF: HIGH FREQUENCY ACTIVE SONAR

Fewer functions are available in High Frequency mode. Marking contacts in this mode places markers on the Nav map but does not assign a Contact ID or send information to TMA. Seawolf can detect contacts up to 5000 yards with this sensor. High frequency returns provides an outline of ice keels making it a valuable tool for under ice operations as well as navigating mine fields.

To Activate HF Sonar:

- Click **FREQUENCY** in the Active Sonar button matrix. The frequency options appear in the matrix.
- Click **HIGH** then **BACK**. The HF button matrix appears.

NOTE: Continuous pings are transmitted as soon as High is selected and contacts appear in the Active Display immediately. You must click **BACK** to access the HFAS button matrix and the **MARK** button

The High Frequency Button Matrix

This button matrix contains only two buttons.

Frequency: Displays options for selecting either Medium or High frequency sonar transmissions.

Mark: Marks all contacts detected by the sensor and places a marker on the Nav map for each one.

Marking Contacts with HF Sonar

- Click **MARK** once. A marker is placed on the Nav map for each contact detected by the sensor

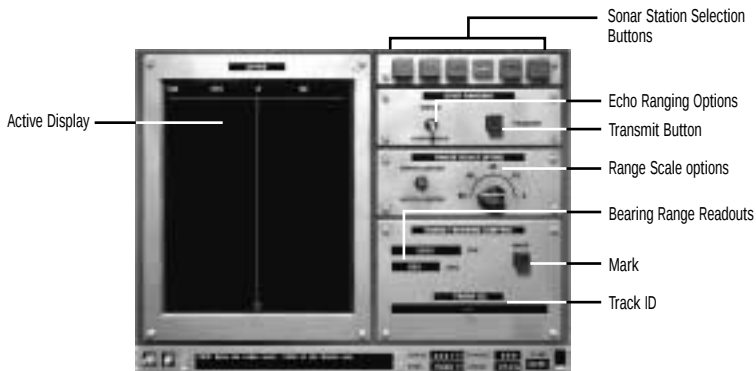
NOTE: It is not necessary to select contacts with the Bearing/Range cursor to mark them or to click more than once.

To return to Medium Frequency Active Sonar view:

1. Click **FREQUENCY** on the button matrix to display the Frequency options.
2. Click **MEDIUM** then **BACK**

688(I): ACTIVE SONAR STATION

The 688(I)'s high frequency sonar interface is located on the Ship Control Station. That high frequency function is described immediately after the description of 688(I)'s Active Sonar station. Instructions for how to use the active sonar function is contained in *Ship Stations/Sonar Stations/Using Medium Frequency (MF) Active Sonar* on p. 83.



688(I)'s Active Sonar station contains the following buttons:

Single/Continuous Toggle Switch: Click the desired word to select either single or continuous transmission mode. In Single mode a single ping is transmitted. In Continuous mode pings are transmitted until you change the setting back to Single or change the range scale.

Transmit: Click to transmit active echo ranging signals of the type selected with the adjacent toggle. Click again to halt the transmission of continuous signals.

North Center/South Center: When North Centered is selected, the display is centered on bearing 000. When South Centered is selected, the display is centered on bearing 180.

Range Scale (KYDS): Selects the maximum range in the Active Display. To select a range scale, click the number of your choice.

Range/Bearing Controls: YDS: Displays the selected contacts distance from Ownship in yards.

Range/Bearing Controls: DEG: Displays the selected contact's bearing.

- To select a contact, move the square cursor over the contact.

Mark: Assigns a contact ID and sends data on the selected contact to TMA and the Nav map.

- Ensure that the cursor is centered on the most recent return from the contact and click **MARK**.
- Select a previously marked contact and click **MARK** again to update the contact's range and bearing information in TMA and on the Nav map.

Track ID: Shows the alphanumeric designation of a marked contact—S01, S02, etc.

688(I): High Frequency Active Sonar

688(I) HIGH FREQUENCY ACTIVE SONAR

The 688(I)'s High Frequency Sonar controls are located in Ship Control.



To use 688(I)'s High Frequency Active Sonar (HFAS):

Press **[E]** or select the Ship Control Station from the pop-up Stations menu to move to the Ship Control Station. The HFAS system is located in the center portion of the station. The toggle switch activates the High Frequency Sonar System (HFSS), which is used to detect small objects and ice keels at short range.

The High Frequency Sonar screen shows the location of any object near your submarine's bow. If an object is close enough, clicking on it designates it as a HF sonar contact on the Nav map.

- Click **ON** to activate the High Frequency Sonar System,
- To mark contacts (such as mines), point at the object and click on the object. Map markers appear on the Nav map indicating all HF Sonar returns. No Contact ID is assigned and no information is sent to TMA.

AKULA: ACTIVE SONAR STATION

Instructions for designating a target using Akula's Medium Frequency Active Sonar is included in *Using Medium Frequency (MF) Active Sonar* on p. 83. Instructions for the use of Akula's High Frequency Active sonar follows a brief description of the Active Sonar Station buttons and panels in this section.



Active Display: Shows results of active sonar echo ranging. Use of this display is explained in *Using Medium Frequency (MF) Active Sonar* on p. 83

Mark: Sends range and bearing of the selected contact to TMA and assigns an alphanumeric Contact ID to the contact

- To select and mark a contact, position the cursor over the contact and click **MARK**.

Track ID: Shows the alphanumeric identifier for the selected contact

Sonar Station Selection Panel: Click the desired button to switch to that Sonar Station. During gameplay hold your cursor over the button to display the station name.

Transmit: Click this button to transmit a single ping.

Transmit Continuous: Click this button to transmit continuous sonar pings. To stop active transmissions click the button again. If you switch the range scale while transmitting continuous pings you must restart transmissions.

Range Scale: Sets the maximum range in the Active display.

Range: Displays the range at the location of the Active Display cursor.

Bearing: Displays the bearing at the location of the Active Display cursor.

AKULA: HIGH FREQUENCY ACTIVE SONAR

The Akula's High Frequency Active Sonar (HFAS) shares a screen with the upward looking High Frequency Under Ice Display. The **High Frequency Active Sonar Display** can only be reached from the Periscope Station. HFAS is useful for traversing mine fields and when operating under the ice. The Akula's HFAS has a range of 3500 yards.

To activate Akula's High Frequency Sonar:

1. Press **[F8]** or select the periscope icon button in the Stations menu to move to the Periscope Station.
2. Click the **ICE DISPLAY** button to move to the High Frequency Display
3. Click **FORWARD LOOKING** in the Alignment Panel. HFAS returns from in front of the ship appear in the display screen. Click **UPWARD LOOKING** to use sonar returns to judge ice thickness above your ship. See *Ship Stations/Under Ice Display* on p. 45.

Marking contacts in High Frequency Active Sonar:

- Click the HFAS Display to place a marker on the Nav map for all contacts detected by the sensor. No contact IDs are assigned to HFAS contacts and no information is sent to TMA.

NOTE: For information on avoiding ice and under ice missions, see *Ship Stations/Under Ice Display* on p. 45.

ACTIVE INTERCEPT SONAR STATION



The Active Intercept Display alerts you to when another ship, sub, dipping sonar or sonobouy is transmitting an active sonar ping. It provides the bearing of the transmitting entity as well as the frequency between pings, the age of the last signal and the strength of the signal. Knowing the signal strength can assist you in determining the relative proximity of the active sonar source. Seawolf also provides the Signal to Noise ratio of the selected contact.

Active Intercept operates the same way on all controllable subs. When Active Intercept detects an active sonar ping, a line is seen on the active intercept display on the bearing of the contact. The strength of the signal is represented as colored lights directly below the display that ascend from

green to red as the signal grows in strength.

ALL SUBS: BUTTONS AND LABELS

The following fields and buttons are seen on all subs except as noted:

Frequency: Displays the frequency of the intercepted signal.

Bearing: Displays the bearing of the intercepted signal.

SNR: Displays the Signal to Noise ratio for the selected contact. (Seawolf only.)

Interval: Displays the interval between the last two signals.

Age: Displays the time in seconds since the last signal.

Mark: When a contact is detected and visible on the Active Intercept Display, clicking the Mark button assigns a Contact ID to the signal and sends the bearing information to TMA. Each time that you click mark when the signal is selected, the current bearing of that contact is sent to the TMA.

- To select a signal, click the signal lines in the Active Intercept Display. The cursor moves to mark that bearing. When the contact's signal is selected, click **MARK**.

Signal Strength: Indicates the strength of the selected signal. Green indicates a weaker signal, red a stronger one.

Active Intercept Display: A line from the center of the circular display to its outer edge indicates the bearing of an intercepted signal. The thicker the line, the stronger the contact.

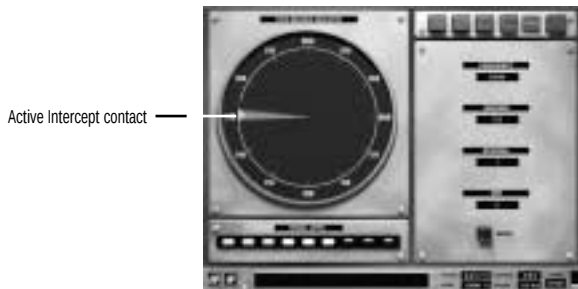
SEAWOLF: ACTIVE INTERCEPT STATION

The Seawolf's Active Intercept Station is seen below. Buttons and labels are described above.



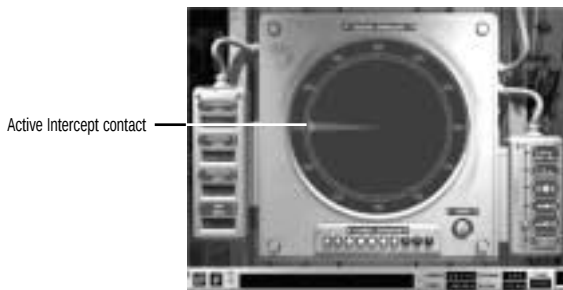
688(I) ACTIVE INTERCEPT STATION

The 688(I)'s Active Intercept screen is seen below. Buttons and labels are described in *Ship Stations/Sonar/Active Intercept Sonar Station/All Subs: Buttons and Labels* on p. 92



AKULA' ACTIVE INTERCEPT STATION

The Akula' Active Intercept screen is seen below. Buttons and labels are described in *Ship Stations/Sonar/Active Intercept Sonar Station/All Subs: Buttons and Labels* on p. 92



SSP SONAR STATION (SOUND SPEED PROFILE)



The SSP Station displays the speed at which sound is transmitted at various water temperatures and depths in the area around Ownship. Water typically forms distinct layers of density, which profoundly affect sonar transmissions. Warmer, less dense water forms the upper surface duct—below this, temperatures fall off sharply and density increases. The effect of this process is sound generated in one layer doesn't tend to transmit easily to the other layer, and vice versa. At the beginning of any mission, always check the depth at which the surface duct separates from the lower thermal.

If for example the thermal layer is at 350 feet and you are above that depth, you may have difficulty detecting objects below 350 feet. Any enemy sub lurking below the layer may also have difficulty detecting your ship.

The Sound Speed Profile is created from information returned from an Expendable Bathythermograph (XBT) probe. When launched, this probe reports depth, temperature and sound speed information in both graph and table form. Steps for generating a Sound Speed Profile are the same on all controllable subs.

LAUNCHING AN XBT PROBE

When you enter the SSP station the last received results are available. These steps clear the existing profile and initiates a new XBT reading.

Seawolf:

- Click **LAUNCH** in the button matrix. The layer depth is reported in the Data Display area above the button matrix.
- To change the range seen in the graph, click **CHANGE DEPTH SCALE**, click the desired number then click **BACK**.

688(I):

- Click **XBT**. The layer depth is noted at the bottom of the clipboard. You cannot adjust the depth scale on the 688(I)s.

Akula:

- Click **XBT**. The layer depth is noted at the bottom of the notepad.
- To change the depth scale in use on the graph, click the desired number in the Depth Scale Panel.

Updated information does not appear instantly on the screen. The XBT probe rises to the surface and then descends before it begins reporting. This may result in a delay before the SSP updates.

NOTE: Due to varying water temperatures at locations around the world, a distinct thermal layer is not always present.

SEAWOLF: SSP STATION



Sound Speed Profile: Displays in graph and table format the temperatures and speed data for the area around Ownship. This data is not updated automatically. You must launch a new probe to get updated information.

Data Display

Layer Depth: Depth of the thermal layer as reported by the last XBT probe.

Button Matrix

Change Depth Scale: Clicking this button displays a set of options to set the scale viewed in the graph. Choose 500, 1000, 2000, or 4000 feet.

Launch XBT: Click to launch a new Expendable Bathythermograph (XBT) probe.

Sonar Station Selection Buttons: Click to move from one sonar station to another.

688(I): SSP STATION



Sound Speed Profile: Displays a representation of the thermal layer in graph format.

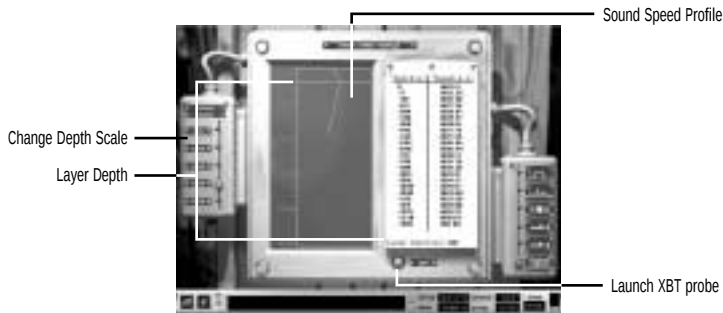
Sonar Station Selection Buttons: Click the desired button to move from one sonar station to another.

Depth (Ft)/ Speed (M/sec): Displays the depth and sound speed reports from the last XBT probe.

Layer Depth: Depth of the thermal layer as reported by the last XBT probe.

XBT: Click to launch a new Expendable Bathythermograph (XBT) probe.

AKULA: SSP STATION



Depth Scale: Displays the depth scale options for the SSP graph in the Sound Speed Profile display.

- Click the desired number to set the graph at 150, 300, 600, 1000, or 1500 meters.

Sound Speed Profile: Displays a representation of the thermal layer in graph format.

Sonar Station Selection Buttons: Click the desired button to move from one sonar station to another.

Depth (m/ Speed (m/sec): Displays the depth and sound speed reports from the last XBT probe.

Layer Depth: Depth of the thermal layer as reported by the last XBT probe.

XBT: Click to launch a new Expendable Bathythermograph (XBT) probe.

UUV SONAR

The UUV itself appears as a contact in the Broadband and Narrowband Displays but UUV sonar returns are not viewed in the Sonar Suite. UUV sonar contacts display on the Nav and Fire Control maps and in TMA. For information on this sensor and its use see *Special Operations and Procedures/Deploying UUVs* on p. 149.

TARGET MOTION ANALYSES (TMA) STATION



At the Target Motion Analysis (TMA) station, data from your sensors are used to determine a contact's bearing, range, speed and course. This information, called a target solution or simply the solution, is necessary to accurately target a contact with your ship's weapons.

The alphanumeric designations of all contacts appear in a drop-down list on the TMA station. Selecting a contact from the list displays a history of bearing lines for that contact on the TMA board.

NOTE: When a sonar tracker is assigned to a contact, bearing updates are automatically sent to the TMA board. While radar, ESM, single-ping active sonar and visual contacts appear in the list, these contacts are not updated on the TMA board unless you physically mark them again. The history for these contacts may contain only one line. Your Auto-Radar Crewman, when activated, sends updates for radar contacts as long as the radar is on.

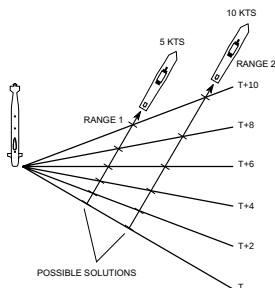
The first letter of the contact designation represents the source of the data: S for Sonar, R for Radar, V for visual (Periscope and Stadimeter), and E for ESM. TMA bearing lines are color coded to indicate its source.

Bow sonar array:	White
Hull sonar array:	Blue
Towed sonar arrays:	Purple
Active sonar:	Green
Periscope or ESM:	Red
Radar:	Yellow
UUV passive sonar	White
UUV active sonar	Green

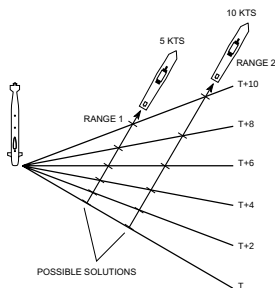
HOW DOES TMA WORK?

Target Motion Analysis is a process by which a contact's course and range are estimated using timed bearing readings and an estimate of the target's speed. At the TMA Station you examine available sensor data on a contact and develop possible or trial target solutions.

Suppose your submarine is stationary and one of your passive sonar sensors is tracking an unknown contact. If at two-minute intervals you could draw a line from your ship along the bearing at which the contact is detected, it would look something like the diagram below.



When using passive sonar, the exact range of the contact is not known. Several solutions for the target might match this bearing fan. For example, the contact could be close to you moving at 5 kts or twice as far from you and moving at 10 kts. If you know the speed at which the contact is traveling, its range and course can be estimated.

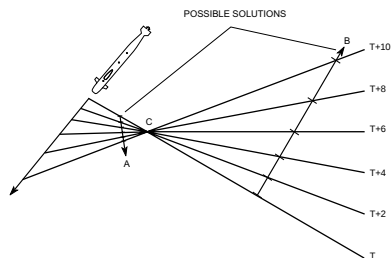


A new factor is added to the bearing rate (change in bearing over time) when your ship is moving as well. However, the principle remains the same.

One concept submariners frequently use is that of lead and lag courses (legs) for Ownship. A lead course is one where Ownship's course and the target's course are on the same side of the line of bearing. With a lag course, the target's course and Ownship's course are on opposite sides of the line of bearing. In the drawing below, Ownship has a lead course on possible solution A and a lag course on possible solution B.

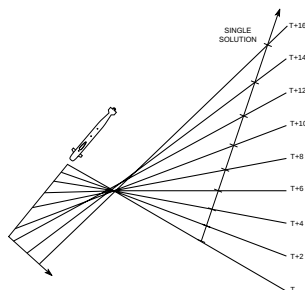
Point C where the lines of bearing cross indicates the maximum range for lead course contact A and a minimum range for lag course contact B.

As you can see in the drawing, you cannot initially be sure whether you are leading or lagging a contact. You can determine this after you turn your ship to a course on the opposite side of the line of bearing.



By changing your ship's contribution to the bearing rate you can mathematically reduce the number of possible solutions for the available data. You do this by changing the course and/or speed of your submarine. The more you change your ship's contribution to the bearing rate, the more dramatic the change in the data. In most cases the leg with the larger bearing rate indicates a lag course. For a broadband contact, this may be easier to see on the sonar waterfall display.

If the contact maintains its course and speed and the sonar bearings are very accurate (they may not be for weak contacts), two or three Ownship maneuvers, or legs, will result in a single possible solution if the maneuver produces a moderate change in bearing rate.

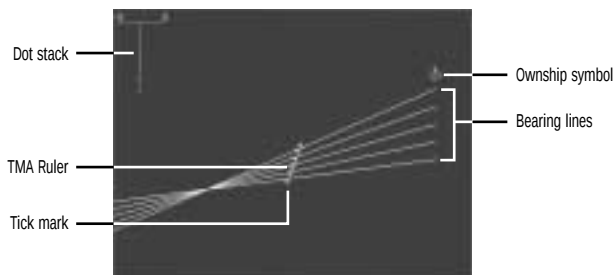


Use all available information when creating your trial solutions. If an intel message informs you the contact is on a specific course or traveling at a specific speed, enter those values in the trial solution fields. Knowing a second value, such as speed, eliminates a large number of possible target solutions. Once a contact is classified, determine its speed using the DEMON function in Sonar.

THE TMA BOARD

The TMA board is located in the upper left area of the TMA Station. The board displays a representation of Ownship, a history of bearing data for a selected contact, a TMA ruler and an

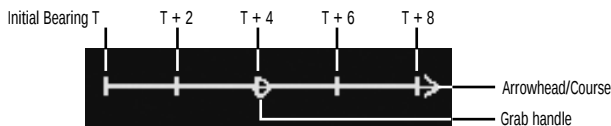
error dot stack. These tools are used to analyze sensor inputs. The Akula's TMA board components are seen and described below.



When a contact is selected from the drop-down list, the most recent sensor information for that contact is displayed on the TMA Board. The information consists of a line of bearing extending from a dot representing Ownship's position at the time of the report. If a tracker is assigned to the contact, every two minutes the latest line of bearing is added to the board. Over time these lines provide a history of bearing changes that provides valuable information. Dragging and positioning the ruler across the lines of bearing allows you to test out possible solutions. The dot stack provides a visual cue as to the accuracy of your trial solution. The oldest bearing lines are deleted after a set amount of time. The tools used on the TMA board and the specifics of this process are described below. Learning TMA is not easy. If necessary, pause the game while you attempt to develop an accurate solution.

THE TMA RULER

The TMA ruler is used to indicate your best estimate of the contact's course and speed. Its location on the board relative to Ownship indicates your estimate of the range of the contact. With each new bearing line an additional tick mark is added to the ruler. Each tick mark is associated with a dot in the upper left of the screen. Moving the ruler and adjusting the location of the tick marks allows you to line up the dots along the vertical line. The ruler components are described below.



- The arrowhead on the ruler indicates the course of the contact.
- The length of the ruler represents the current estimate of the contact's speed: the longer the ruler, the faster the estimated speed.
- The distance of the ruler from the Ownship marker represents the contact's estimated range.
- Each tick mark represents a specific interval of time. (Towed and Bow arrays update every two minutes while radar and continuous active sonar update with every sweep or ping.) The mark at the end of the ruler represents the initial or oldest information.

- The estimated current bearing of the contact is a point just ahead of the arrowhead. The last reported bearing is represented by the tick mark closest to the arrowhead.

NOTE: All of the current estimates represented by the ruler appear in numerical form under the TMA board.

Manipulating the Ruler:

- **Adjusting length and direction:** Click and drag the end mark or the arrowhead to adjust the length or direction of the ruler.
- **Positioning Tick marks:** The tick mark closest to the arrowhead should be placed on the most recent bearing line. The end tick mark should be positioned on the initial or oldest bearing line.
- **Using the Handle:** A circle appears at the center of the ruler when more than one tick is present and speed is more than zero. The circle acts as a handle. Click the handle and drag the entire ruler to another location. The handle maintains the current course and speed settings of the ruler and adjusts range and bearing.

Sub Command Tip: Center on the ruler and zoom in to better manipulate the ruler and access the handle. If you have difficulty dragging the ruler to get the arrowhead pointed in the desired direction, enter the desired course number in the course field. You can also press q and click the TMA board where you want to place the end of the ruler or press q and right-click to place the arrowhead.

THE TMA DOT STACK

The dot stack in the upper left corner is a graphical representation of the error between tick marks and bearing lines. The dot at the top of the stack is associated with the most recent bearing line. The analysis is probably correct when the top most dots are on the centerline. This process is called stacking the dots.



TMA ON RADAR, ACTIVE SONAR AND VISUAL CONTACTS

Some sensors give you a range as well as a bearing, while others only give you a bearing. In general, the more inputs you have from different sensor sources the better your solution will be. But be aware that using Radar and Active Sonar give your enemy valuable information about your presence and location.

Contacts marked with active sonar, radar and the Stadimeter appear as a bearing/range pair on the TMA Board. What you see is a bearing line ending with a tiny triangle positioned at the range of the contact. If the target's bearing and range are known at two different times, as is the case with active sonar and radar, the solution can be found by connecting dots and 'drawing a line' with the ruler for course and speed.

A UUV in active mode provides returns from the location of the UUV in TMA and on the Nav and Fire Control maps.

NOTE: Marking a contact with the periscope does not give you an automatic range. But using the Stadimeter to manipulate a photo of the visual contact can provide you with a range that is fairly accurate. See *Ship Stations/Stadimeter Station* on p. 141. When visual or periscope contacts are referred to in this section, it is assumed that you have determined a range for the contact and marked it in the Stadimeter Station. The Periscope and Stadimeter Stations work hand in glove.

To determine a target solution from Active Sonar, the Periscope or the Radar:

1. Select a contact to analyze. Radar contacts have an R designation, visual contacts have a V designation, active sonar contacts have an S designation the same as passive sonar contacts. A bearing line appears on the TMA board. A tiny triangle at the end of the bearing line indicates the target's range at time the contact was marked.

Seawolf:

- Click **SELECT TRACKS** in the Button Matrix. (If no contacts have been designated, the second level of matrix buttons is not revealed.)
- From the **Select** drop-down list, select the desired Contact ID.
- Press **BACK** to return to the Main Button Matrix.

688(I) and Akula:

- Click the **Select Track** drop-down list and select the desired contact. No contacts appear in the drop-down lists if no contacts have been designated.

2. Mark the contact again.

- After a short interval, return to the active sonar or radar station (whichever you are using) and mark the contact again.
- For visual contacts, take another photo of the contact from the periscope and manipulate it in Stadimeter, then mark the contact again from the Stadimeter Station.
- Continue to mark the contact at different intervals to accumulate several bearing lines. Toggle back and forth between the TMA and your chosen sensor.

3. Adjust the view to get a clear view of the ruler and the range triangle.

- Click the arrow buttons to pan the view. (The keyboard arrow keys can also be used.)
- Move the ruler to the location of the range triangle, click **CENTER ON RULER** then click the zoom buttons to better adjust your view. If you lose site of the ruler, zoom all the way out or reselect **CENTER ON RULER**.

4. Adjust the tick marks.

- Drag the arrowhead or tail of the ruler to adjust the tick marks along the bearing lines until the dots line up in the dot stack.

5. Enter the solution

When you have a good trial solution, send it to the Fire Control system by entering the solution. The solution you enter is now the system firing solution for that contact. The system tracks the estimated position of the contact based on this solution and uses that estimated location when targeting the contact.

Seawolf:

- Click **ENTER SOLN** beneath the TMA Board.

688(I):

- Click **ENTER SOLUTION** in the TMA Solution Input panel below the TMA board.

Akula:

- Click **ENTER SOLUTION** below the TMA board.

The system solution displays on the TMA screen in a separate location from the trial solution input area as described below.

■ **Seawolf:** The system solution displays in the Firing Solution area of the TMA Data Display on the right-hand side of the station.

■ **688(I) and Akula:** The system solution displays in the TMA Solution panel at the lower right of the TMA station.

NOTE: The system solution for a contact can be viewed in these locations but they can not be adjusted there. To update the system solution, adjust the ruler or directly input information in the trial solution fields and enter the solution again.

TMA ON PASSIVE SONAR AND ESM CONTACTS

As described earlier, a more complex situation arises when only the contact's bearing is known, as is the case with passive sonar and ESM. Passive sonar contacts can be assigned trackers but ESM contacts must be updated manually by repeatedly marking the contact at the ESM Station. Because you must be at periscope depth to use ESM and your mast can be detected by enemy radar, you are at greater risk when you use this sensor.

Contacts detected by a UUV in passive sonar mode are displayed from the location of the UUV on the TMA board and in the Nav and Fire Control maps.

To perform TMA on passive sonar contacts:

1. Select a contact to analyze. A bearing line or lines appear on the TMA Board.

Seawolf:

- Click **SELECT TRACKS** in the button matrix. (If no contacts have been designated, the second level of matrix buttons is not revealed.)
- From the **Select** drop-down list, select the desired Contact ID.
- Press **BACK** to return to the main button matrix.

688(I) and Akula:

- Click the **Selected Tracks** drop-down list and select the desired Contact ID. No contacts appear in the drop-down lists if no contacts have been designated. Return to a sensor and mark a contact or assign a tracker.
2. Adjust your view of Ownship, the bearing lines, and the ruler.

- Click the arrow buttons to pan the view. (The keyboard arrow keys can also be used.)
- Move the ruler to the desired location, click **CENTER ON RULER** then Click the zoom buttons to better adjust your view. If you lose sight of the ruler, zoom all the way out or select **CENTER ON RULER**.
- Click the ruler handle or the single tick mark if the handle is not present and drag the ruler to the desired location.
- Click **CENTER ON RULER** to place the ruler in the center of the TMA Board then zoom in or out as desired to adjust the view.

NOTE: The ruler handle is only visible when the ruler contains more than one tick mark or speed is set to greater than 1 knot (kt) in the Speed field in the trial solution area. You must zoom way in on the ruler to see it at that speed. You can also set the speed to 10 kts or more temporarily. This will expand the ruler and reveal the handle.

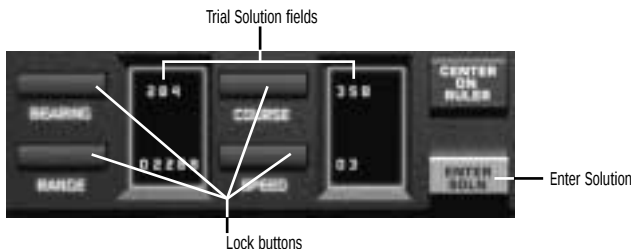
3. Adjust the ruler position to estimate the contact solution.

- If this is the first time that TMA has been performed on the selected contact, the ruler will represent the default solution of a range of 10,000 yards, with a closing course and a speed of 10 kts. These values appear in the trial solution fields directly below the TMA board.

4. Enter any known data in the trial solution data fields.

If you have additional data on the contact's range, or course, for example from an intelligence message, enter it in the appropriate solution field. If you have determined the contact's speed using DEMON, enter that speed in the solution field. See *Sonar/DEMON Station* on p. xxx.

- Click the digits to cycle through the values.
- If you are sure about one aspect of the solution (e.g. range) enter that value directly into the Range field then lock the field. That keeps you from dragging the ruler to a different range.
- To lock a field click the button associated with the field.
- **Seawolf:** Lock buttons are located above the label text for the trial solution fields. Label text is green when a field is locked.
- **688(I):** Lock buttons are located to the right of the label text for the Solution Input fields. Buttons are orange and light up when the field is locked
- **Akula:** Lock buttons are located to the right of each trial solution field. They are red and light up when the field is locked.



5. Adjust the ruler to fit the bearing lines.

Adjust the ruler on the display until the tick marks align well with the contact bearing lines.

- Click the handle in the middle of the ruler to drag the entire ruler.
- Click and drag on either end of the ruler to move just that end or to adjust the length of the ruler.

6. Enter solution.

When a good match between the tick marks, the bearing lines and the dot stack has been achieved, enter the trial solution to send this information to the Fire Control system. The system tracks the estimated position of the contact based on this system solution and uses that estimated location when targeting the contact.

Seawolf:

- Click **ENTER SOLN** beneath the TMA Board.

688(I):

- Click **ENTER SOLUTION** in the TMA Solution Input panel below the TMA board.

Akula:

- Click **ENTER SOLUTION** below the TMA board.

The system solution displays on the TMA screen in a separate location from the trail solution input area as described below.

■ **Seawolf:** The system solution displays in the Firing Solution area of the TMA Data Display on the right-hand side of the station.

■ **688(I) and Akula:** The system solution displays in the TMA Solution panel at the lower right of the TMA station.

NOTE: The system solution for a contact can be viewed in these locations but they can not be adjusted there. To update the system solution, adjust the ruler or directly input information in the trial solution fields and enter the solution again.

7. Change course and/or speed.

Changing your course and/or speed can refine the TMA solution. This changes the relative motion between your submarine and the contact. After steadying on the new course and/or speed, adjust the ruler to achieve the best fit. This second "leg" should help to eliminate solutions that are unreasonable. A third "leg" or more will refine the solution further.

■ With experience, you'll learn when the solution is good enough to support a weapon launch.

NOTE: Depending on the tactical situation, continued TMA may not be practical.

■ If one TMA solution does not fit the entire observed sensor bearing data, consider the fact that the contact itself may have changed course and/or speed. Attempt to achieve a better fit of the ruler by disregarding some of the earlier bearing lines and looking only at recent bearings.

8. Merge contacts when necessary.

If the same contact is tracked by more than one sensor (e.g., a contact tracked by passive sonar and radar), the data can be merged into a "master" contact. (Master contacts have alphanumeric designations that begin with the letter M.) This can be very useful if you have a good range from one sensor (radar or active sonar) and a good bearing history from another (passive sonar).

Seawolf:

- Click **SELECT TRACKS**. The second level button matrix appears.
- Select a contact from the **Select** drop-down list.
- From the **Merge** drop-down list select the contact you want to merge with the contact in the Select drop-down list.
- Click **MERGE**.

688(I) and Akula:

- Click the **Selected Track** drop-down and select the one of the contacts to be merged.
- From the **Merge** Track drop-down select the track to be merged with the contact selected in the Selected Track drop-down list.
- Click **MERGE**.

This decision can be undone by selecting the master contact (e.g. M01) and clicking **SPLIT**.

- Merging contacts held on the sphere/cylindrical and UUV or towed arrays can give a fairly accurate range using triangulation. The point where matching sphere and UUV or towed array bearings cross is a good approximation of the contact's range. This method is most accurate on close range contacts a beam of Ownship, but is highly susceptible to bearing error off the bow or stern of Ownship, or at great ranges.

NOTE: If the TMA Auto Crewman is activated, he does everything for you. You can make no TMA inputs yourself. For more information on your TMA Auto Crewman see *Auto Crewmen* on p. 146.

TMA ON UUV SENSOR CONTACTS

All controllable submarines can carry Unmanned Underwater Vehicles (UUVs). UUVs in Sub Command have sonar capabilities only and can not launch weapons. For information on launching UUVs see *Special Operations and Procedures/Deploying UUVs* on p. 149. The lines of bearing for contacts detected by a UUV are drawn from the location of the UUV at the time of the report, not from Ownship's location. TMA on UUV contacts is performed as for any other sonar contact in active or passive mode.

SEAWOLF: TMA STATION

Use of the TMA station is included in first portion of the TMA section. The Seawolf's Button Matrix and Data Display are described below.



TMA Board: Contains the bearing history for the selected contact as well as the TMA ruler and Dot stack as described in the early portion of the TMA section. The range and bearing of the cursor's location on the TMA Board appears in the upper right corner of the board.

Seawolf Trial Solution Area

Bearing, Course, Range, and Speed Fields: Represent the trial solution for the selected contact. The current position and size of the TMA ruler is reflected in these fields. These numbers are altered by dragging and sizing the ruler or by entering values directly into these fields. To lock in a particular value, click the button directly above the label. When a value is locked, the text of the button label is green.

NOTE: Changing the digits in the Range and Bearing fields can only be accomplished by first locking the field. Adjusting these two values moves the ruler in ways you might not anticipate. These fields should only be locked if you know a bearing and range information from a separate source, for instance radar or active sonar.

Center on Ruler: Click this button to bring the ruler to the center of the TMA Board.

Enter SOLN: Enters the current trial solution into the system and designates it as the current **Firing Solution** for this target. (Also called the system solution or TMA Solution.)

Seawolf TMA Data Display

Contact fields: The upper Contact field displays the contact ID that is selected in the **Select** drop-down list and the second instance displays the contact ID that is selected in the **Merge** drop-down list. See Select Tracks below.

Source fields: The upper Source field displays the sensor source (e.g. Sphere or Towed) of the contact selected in the **Select** drop-down list and the second instance of the word displays the sensor source of the contact selected in the **Merge** drop-down list. See *TMA Button Matrix/Select Tracks* below.

Firing solution: Also called the system solution, the values seen here are entered by clicking Enter SOLN. They represent the current solution in use in the Fire Control system if this contact is selected as a target. The range and bearing fields update based on the course and speed in use in the Firing Solution.

Seawolf TMA Button Matrix

Select Tracks: Click to display the contact selection matrix and the following options:

Merge: Merges the contacts selected in the **Select** and **Merge** drop-down lists.

Split: Splits the merged contact (M contact) selected in the **Select** drop-down list into its two original contact components.

Drop: Permanently drops the contact selected in the **Select** drop-down list.

Select Drop-down list: Displays the Contact IDs of all current contacts. When a contact is selected here its bearing history is displayed on the TMA board.

Merge Drop-down list: Displays all Contact IDs except that of the contact selected in the **Select** drop-down list. When a contact is selected here, its bearing history appears on the TMA board along with that of the contact selected in the **Select** drop-down list.

Back: Returns to the main level button matrix.

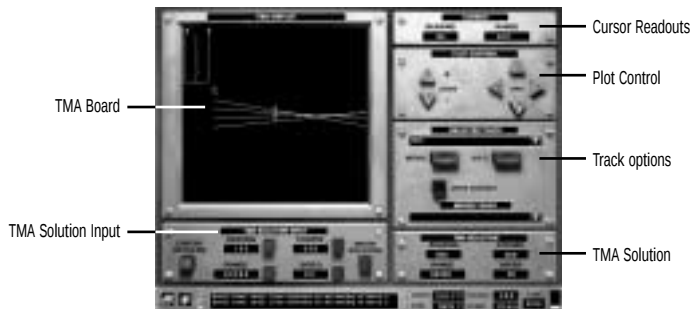
Time: The numbers seen in this matrix represent minutes of bearing history to be displayed on the TMA Board. As long as a tracker is tracking, the bearings are plotted every 2 minutes, therefore 10 min = up to 5 bearing lines, 20 min = up to 10 bearing lines, etc. Options are 10, 20, 60 and 240 minutes.

Center on Ownship: Click to center the Ownship symbol at the center of the TMA Board.

Zoom In, Zoom Out and arrow buttons: Clicking these buttons adjusts the view on the TMA Board.

688(I) AND AKULA: TMA STATIONS

Use of the TMA station is included in the first portion of the TMA section. The 688(I)'s and the Akula's TMA stations contain nearly all the same labels. The two stations are seen here and the labels and buttons are described below.



688(I) TMA Station



Akula TMA Station

TMA Board: Contains the bearing history for the selected contact as well as the TMA ruler and Dot stack as described in the early portion of the TMA section.

Time History Menu

As long as a tracker is tracking, bearing information is sent to TMA in two minute intervals. Right-click the TMA Board to change the bearing return history on the TMA Board. The following options are available:

10 min = up to 5 bearing lines

20 min = up to 10 bearing lines

60 minutes = up to 30 bearing lines

240 minute = up to 60 bearing lines

TMA Solution Input (688(I)) / Trial Solution Area (Akula)

Center on Ruler: Click here to place the TMA ruler in the center of the TMA Board.

Bearing, Course, Range, and Speed Fields: Represent the trial solution for the selected contact. The current position and size of the TMA ruler is reflected in these fields. These numbers are altered by dragging and sizing the ruler or by entering values directly into these fields.

■ **688(I):** When a value is locked, the orange button is illuminated.

■ **Akula:** When the value is locked the red button is illuminated.

Enter Solution: Enters the values in the Solution Input (trial solution) fields into the system and designates it as the TMA Solution. These values are now the system firing solution for this target.

Cursor readouts Range/Bearing: These fields display the current range and bearing of the cursor's location on the TMA Board.

Plot Control (688(I)) / View Controls (Akula): Click to zoom in and out or pan the view on the TMA Board.

Track Options

Selected Track drop-down list: Lists Contact IDs currently designated in the mission.

Merge: Click to merge the contact selected in the **Selected Track** drop-down list with the contact selected in the **Merge Track** drop-down list.

Split: Splits the merged (M) contact selected in the **Selected Track** drop-down list into its two original contact components.

Drop Contact: Click to permanently drops the contact selected in the **Selected Track** drop-down list.

Merge Track drop-down list: Lists all contacts except the contact selected in the **Selected Track** drop-down list.

TMA Solution: Displays the TMA solution in use by the Fire Control system for the selected contact.

FIRE CONTROL SUITE



From the stations of the Fire Control Suite weapons are selected, contacts are targeted, weapons are launched and countermeasures are deployed.

BASIC LAUNCH PROCEDURES

The basic steps for launching a weapon from Fire Control are the same regardless of which sub you are driving and are shown here. More explicit instructions are covered later in this section by submarine class.

BASIC LAUNCH PROCEDURES FOR SEA TARGETS

Basic launch procedures for torpedoes and antiship missiles are shown here.

1. Decide on the contact or line of bearing (LOB) that you want to attack. Assign that Contact's ID to a tube containing a weapon appropriate for the contact.
 - To shoot a weapon down a specific LOB select Snapshot instead of a specific contact ID. If a contact still has a visible LOB on the Fire Control map you can only target it with a Snapshot. You can not assign that contact's ID to a tube.
 2. Enter presets for the weapon in the selected tube. Presets are instructions given to the weapon before it is launched regarding its search mode, when it should enable, and the maximum and minimum depth run depth among others. Presets differ depending on the weapon type. These are defined later in this chapter.
 - If your Fire Control Auto Crewman is on, he enters the presets for you.
 - For a Snapshot, enter the desired LOB along with other desired presets.
 3. Initiate the launch process. Before you can launch the weapon you must do the following:
 - Flood the tube and equalize the pressure in the tube with that of the water outside the ship. The Seawolf's torpedo tubes and the 688(I)'s VLS tubes are equalized automatically after they are flooded. In the 688(I) and Akula a torpedo tube must be equalized manually after it is flooded.
 - Open the muzzle door. The muzzle door is the opening in the sub's hull through which the weapon passes. Opening this door generates noise that could be detected by nearby ships and subs.
 4. Launch (fire) the weapon.
 - To stop this process or to change the weapon in the tube, or reload the tube after the weapon has been launched, the muzzle door must first be closed. This reverses the process and allows a different weapon to be loaded.
- NOTE:** A torpedo or a UUV can no longer be wire-guided once the muzzle door of the tube that fired it has been closed. Closing the muzzle door cuts the guidance wire.

BASIC LAUNCH PROCEDURES FOR LAND TARGETS

To attack a land target from Fire Control, the latitude and longitude coordinates of the site must be fed into the fire control system and a series of waypoints defined for the missile to follow. The coordinates are usually defined in a tasking message.

1. Select a tube containing a land attack missile. (In the 688(I) and Akula go to the Launch Panel to see what weapons are loaded in each tube or from the Target Display panel click the preset button for a tube to see the name of the weapon loaded.)
2. Define waypoints. In the tube's presets area click **DEFINE TARGET WAYPOINTS** then click the Fire Control map to place four weapon waypoints. Each waypoint can be selected and placed at a specific latitude and longitude. Click the waypoint to display its latitude and longitude presets.
 - The outermost waypoint should be placed at the exact latitude and longitude of the target as specified in your orders.
 - If a landfall waypoint is directed in your tasking make sure that one of the earlier waypoints is placed at that latitude and longitude.
3. Set the destruct range for the missile. This is the range at which the missile will self-destruct if it has not encountered a target.
4. Initiate the launch procedure by flooding the horizontal tube or pressurizing the vertical tube.

NOTE: Land sites with **L** designations can be targeted from the Nav screen using the Contact menu's Engage With command.

BASIC LAUNCH PROCEDURES FOR UUVs

More detailed information about UUVs is found in *Special Procedures and Operations/Deploying UUVs* on p. 149. The basic launch procedures are found here.

1. Set Ownship speed to 4 kts or less
2. Select a tube containing a UUV.
3. By default the UUV is launched at Ownship's depth. Deselect *Use OS Depth* if you want to set a specific depth for the UUV.
4. Select the desired tube in the Launch Panel and initiate the launch procedure as for a torpedo.
5. Enable the wire guide controls to alter the course of the UUV.

Seawolf:

- Select the UUV symbol on the Fire Control map to display the wire guide controls.

688(I) and Akula:

- Select **W** below the tube that fired the UUV to display the wire guide controls.
- If a UUV is in a tube it can be launched from the Command or Ownship menus using the Fire Tube command without visiting the Fire Control Station. It will be launched at Ownship's depth.

NOTE: Closing the muzzle door after launching the UUV cuts the guidance wire. Once the wire is cut the UUV no longer sends sonar returns.

BASIC LAUNCH PROCEDURES FOR MINES

Information on laying a minefield is found in *Special Operations and Procedures/Laying Mines* on p. 150. The basic steps for launching a mine are found here.

1. Select a tube with a SLMM or Mobile Mine assigned. In the tube's preset area the *Define Target Waypoints* preset is available.
2. Click **DEFINE TARGET WAYPOINTS** then click the Fire Control map to place a single waypoint.
3. Adjust the latitude and longitude coordinates of the waypoint as desired. When launched, the mine will travel to that latitude and longitude.

Seawolf:

- Click the waypoint on the Fire Control map to display the waypoint preset panel.

688(I) and Akula:

- The waypoint presets appear below the Define Target Waypoint button in the preset panel as soon as the waypoint is placed on the map.

TACTICAL WEAPONS

All controllable submarines in Sub Command have been assigned weapons capable of targeting surface ships, submarines and land targets. Available weapons are described briefly below.

SEAWOLF AND 688(I) WEAPONS

Mk 48 ADCAP (Advanced Capability) **Torpedo:** This weapon can be used against both surface and submarine targets and can be wire-guided. It has a maximum range of 26 n.m.

TLAM (Tomahawk Land Attack Missile): The Tomahawk is the standard sub- launched strike weapon for use against land targets. It has a range of approximately 1400 n.m.

Gameplay Weapons:

TASM (Tomahawk Antiship Missile): For gameplay purposes, TASMs are assigned to the Seawolf and 688(l) class submarines. In actuality, these weapons have been removed from the fleet and are being converted to Tomahawk Land Attack Missiles. The TASM has a warhead of 500 kg and a range of 250 n.m.

Harpoon: (Anti-Ship Missile): While the Seawolf and 688(l) class subs no longer carry Harpoons, they maintain the ability to launch them. They are available in the loadout screen but they are not loaded by default. The Harpoon has a range of 70 n.m.

AKULA WEAPONS

The Akula classes carry these weapons

SS-N-16 Stallion: This anti-submarine weapon flies as a missile on an assigned course then drops an E45-75A Torpedo. In the game the torpedo begins homing as soon as it hits the water. The missile has a range of 27 n.m. The torpedo it drops has a range of 8 n.m. and a warhead of 150 kg. It can also be used against surface targets.

53-65 K Torpedo: This wake homing torpedo works best against surface ships, although it can also be used with limited success against submarines. It has a maximum speed of 55 kts, a range of 7.5 n.m. and carries a 300 kg warhead.

53 cm Torpedo: Primarily an anti-submarine torpedo, it can also be used against surface targets. This weapon has active/passive sonar and wire guidance, a maximum range of 10 n.m., a maximum speed of 40 kts and a warhead of 205 kg.

65 cm Torpedo: This multipurpose torpedo can be used against both surface and sub-surface targets. It has an active and passive sonar guidance system and a range of 35 n.m. It has a maximum speed of 50 kts and a 445 kg warhead.

Gameplay Weapons.

The three types of SS-N-27 weapons the Akula carries in the game are based on the SS-NX-27 Novator Al'fa (3M54/3M51E) class of weapons. While it is believed the Russians currently do not have these weapons on their own submarines, the Russians are exporting versions to other countries for submarine use.

For gameplay purposes the Akulas are given these additional weapons. The SS-N-27 weapons are replacements for the SS-N-21 Sampson missiles. The SS-N-21's have nuclear warheads and it is believed that they have been removed from the fleet. It is reported that the SS-N-27 weapons are compatible with the SS-N-21 launch system.

SS-N-27 ASM: This antiship weapon is based on the 3M51E missile and resembles the American TASM. It has a range of 135 n.m., is low flying and has a warhead of 250 kg.

SS-N-27 ASW: This antisubmarine weapon is based on the SS-N-X-27 Novator Al'fa (3M54) missile designated 91RE1. In gameplay the missile drops a Type 40 torpedo that enables as soon it hits the water. The missile has a range of 18 n.m.; the torpedo has a maximum speed of 40 kts, a range of 8 n.m. and a 150 kg warhead.

SS-N-27 LAM: Based on the 3M14E land attack missile, this weapon also resembles the American Tomahawk. It has a ballistic trajectory and a range of 162 n.m. and carries a 400 kg warhead.

VA-111 SHKVAL: (NATO Nickname: Squall) This high-speed underwater torpedo operates on the principles of supercavitation which allow it to reach speeds of 200 kts. It has a range of 10 n.m. and carries a 250 kg conventional warhead. For gameplay the weapon is modeled as a straight

running torpedo with a magnetic influence detonator. The weapon's run to enable range (minimum range) is 2000 yards. The Shkval is not a subtle weapon. Its use alerts all in the area to your presence. When using this weapon, the hope is it will reach its target before the target can respond. It is known that the Russians have this weapon, it is not known if it is actually carried by the Akulas.

STRATEGIC WEAPONS

MINES: SEAWOLF AND 668(I)

MK 67 SLMM: The submarine-launched mobile mine is a modified Mk 37 torpedo whose warhead was replaced by a Mk 13 mine warhead. The torpedo's propulsion system is used to maneuver the mine to the coordinates programmed into its guidance system. The SLMM has a 235 kg warhead, a maximum speed of 26 kts and a maximum range of 11.5 n.m.

MINES: AKULA

Mobile Mine: The Akula's mobile mine is a modified version of the 53-65K torpedo. Launched via a 53 cm torpedo tube it can travel up to 10 n.m. after leaving the ship. The mobile mine is effective in depths from 4 – 150 meters and has a 480 kg warhead.

COUNTERMEASURES

Countermeasures are defensive weapons used to prevent an enemy's torpedo from destroying your sub. The two types of countermeasures available in *Sub Command* are active decoys and passive decoys:

The passive decoy torpedo countermeasure is used against passive homing torpedoes. The passive decoy emits sound (noise) across a broad spectrum of frequencies in an attempt to deceive the torpedo into homing in on the decoy.

The active decoy torpedo countermeasure is used against active homing torpedoes. The active decoy is a bubble generator that creates an area of bubbles in an attempt to provide a false echo to the torpedo.

Decoys can be placed both deep and shallow when trying to ensure a decoy will be present to deceive an inbound torpedo, and in order to have a decoy on both sides of the acoustic layer because the depth of an inbound torpedo is usually not known. Many torpedoes employ both passive and active homing; therefore, both passive and active countermeasure should be employed.

BASIC STEPS FOR LAUNCHING COUNTERMEASURES

1. Decide which type of countermeasure is desirable for the situation.
2. Select a tube containing the desired countermeasure. Internal tubes can be reloaded with a different CM if the supply of the desirable type has not been exhausted. (Check the weapon inventory to determine how many of each countermeasure you have remaining.)
3. Determine the depth for the CM (Deep or Shallow). In the *Seawolf* you can set a specific depth for each CM launched from the Countermeasure Launch Panel.
4. Launch the Countermeasure.

PRESETS

Everything that can be launched from the Fire Control Station has at least one preset. Presets are instructions that tell the weapon, countermeasure or UUV what to do. While the interfaces that display them are slightly different, presets operate the same from sub to sub. All presets are presented here alphabetically by type.

ANTISHIP MISSILE PRESETS

Harpoon, SS-N-27 ASM, and TASM

The above weapons use the following presets:

Destruct Range: Sets the range at which the missile self-destructs if a target is not encountered. Use this to avoid hitting neutral and friendly ships in the area. (Defaults to 50 n.m.)

Seeker Range: Sets the range at which the missile begins to home. (Defaults to 0 n.m.)

Seeker Pattern: Sets the area to be searched to either a wide or narrow pattern.

■ **Seawolf:** *Wide Seeker Pattern* is selected by default. If *Wide Seeker Pattern* is not selected a narrow seeker pattern is assigned to the weapon.

■ **688(I) and Akula:** Click the Wide/Narrow button to toggle the selection.

NOTE: Your ship must be at 150 ft or less and at 6 kts or less to successfully launch one of these antiship weapons.

COUNTERMEASURE PRESETS (SEAWOLF ONLY)

Passive and Active Decoys

Use OS Depth: Launches the selected countermeasure at Ownship's current depth. *Use OS Depth* is selected by default.

Depth: Deselecting *Use OS Depth* displays the *Depth* preset. To set a specific depth for the mine click the digits to increase increment a number. Right-click a digit to decrease the value.

NOTE: In the 688(I) and Akula you can elect to launch a countermeasure that is preset to either deep or shallow. Selecting Deep sends the CM to a depth of 800 feet/244 meters. Selecting Shallow sends the CM to 100 ft/~30 meters.

LAND ATTACK MISSILE PRESETS

SS-N-27 LAM and TLAM

These missiles have the following presets.

Define Target Waypoints: Click **DEFINE TARGET WAYPOINTS** then click the Fire Control map to place four waypoints for the weapon to follow.

Latitude/Longitude: Click a waypoint to display presets for setting the precise Latitude and Longitude for the waypoint. Click the preset digits to increment the value. Right-click to decrease the value. You can also click a waypoint and drag it to the desired location. Watch the Latitude/Longitude readout in the lower left of the Fire Control map when dragging a waypoint to determine the waypoint's current location.

Destruct Range (nm): Sets the range at which the missile self-destructs if a target is not encountered. Use this to avoid hitting neutral and friendly ships in the area. (Defaults to 50 n.m.)

NOTE: Your ship must be at 150 ft or less and at 6 kts or less to successfully launch one of these Land Attack Missiles.

MINE PRESETS

Mobile Mine and SLMM

Mines display the following presets:

Define Target Waypoints: Click **DEFINE TARGET WAYPOINTS** then click the Fire Control map to place a single waypoint.

Latitude/Longitude: Click the waypoint to display presets for setting the precise latitude and longitude for the waypoint. These coordinates define the final destination of the mine. Click the digits in the preset panel to set the desired value. You can also click a waypoint and drag it to the desired location. Watch the Latitude/Longitude readout in the lower left of the Fire Control map when dragging a waypoint to determine the waypoint's current location.

MISSILE-TORPEDO PRESETS

SS-N-16 Stallion and SS-N-27 ASW

The following presets are available.

Snapshot Bearing (deg): The weapon is fired on the bearing entered here. (This preset only appears if **Snapshot** is assigned to the tube from the Target drop-down list.)

Run To Enable: Sets the point in yards at which the missile drops its torpedo payload. The torpedo falls to the water and enables at once.

ROCKET TORPEDO PRESETS

Shkval

This weapon has the following presets.

Snapshot Bearing (deg): The weapon is fired on the bearing entered here. (This preset only appears if **Snapshot** is assigned to the tube from the Target drop-down list.)

Depth: Sets the depth at which the weapon travels.

Run To Enable: Sets the distance the weapon travels before its sensor enables. (The minimum RTE for this weapon is 2000 yards.)

TORPEDO PRESETS

Mk 48 ADCAP, 53-65K, 53 cm, 65 cm Torpedoes

The following presets are available for torpedoes.

Snapshot Bearing (deg): The weapon is fired on the bearing entered here. (This preset only appears if **Snapshot** is assigned to the tube from the Target drop-down list.)

Depth: Set the depth at which the weapon travels.

Ceiling: Set the depth above which the weapon does not travel.

Floor: Set the depth below which the weapon does not travel.

Active (Seawolf) /Acoustic (688(I) and Akula): Chose *Active* or *Passive* sonar mode. Active mode transmits active pings and follows the returns. In passive mode the weapon does a passive sonar search.

■ **Seawolf:** The *Active* field is selected by default. When *Active* is deselected the weapon is in passive mode.

■ **Akula:** The 53-65K torpedo is a wake homing torpedo. It has no Acoustic setting.

Run To Enable: Set the distance the weapon travels before it enables and starts its active search. Enabling the weapon too soon can alert the target in time to take evasive measures. Enabling too late can mean the weapon runs past the target.

Speed: Set the speed at which the weapon travels.

UUV PRESETS

Use OS Depth: Set the depth at which the UUV travels to that of Ownship. **Use OD Depth** is selected by default. Deselect the option to display the Depth option.

Depth: Enter the desired depth for the UUV to travel. Click a digit to increment the value. Right-click to decrease the value.

FIRE CONTROL MAP

Each controllable sub has a Target Display containing the Fire Control map. All map contact symbols seen on the Nav map are also seen on the Fire Control map. Latitude, longitude and depth readouts are on by default and the range scale is visible.

The TMA solution data for a selected contact appears in the upper left corner of the map. This solution data is constantly updated assuming the course and speed designated when the solution was entered in TMA. This information is used by the Fire Control System to predict the location of the target so the weapon can steer an intercept course until it is close enough to detect the target and begin homing.

CONTACTS WITH LINES OF BEARING

Contact symbols that appear at the end of a line of bearing (LOB) do not yet have TMA solutions. When these are selected, the TMA solution fields display only dashes.

If a contact has only a LOB (no TMA solution) you can not assign that Contact ID to a tube. You must select Snapshot and enter the bearing to the contact in the Snapshot (brg) preset field.

NOTE: If Show Truth is ON, no TMA contact solution data appears on the map when a truth contact is selected and no Contact IDs are listed in the contact drop-down list. Contact IDs are only available when Show Truth is OFF. Only snapshots can be fired at truth contacts from the Fire Control Station. Assign Snapshot and enter the bearing to the truth contact.

Fire Control Map Controls:

- Press **CONTROL** and click the map to zoom in on the clicked location.
- Press **CONTROL** and right-click to zoom out.
- When the map is zoomed in, click and drag on the map or use the arrow keys to adjust the map view.

SEAWOLF: FIRE CONTROL SUITE

Seawolf has four stations in its Fire Control Suite. These are reached by clicking one of the buttons at the bottom left of each of the Seawolf's Fire Control Stations.



SEAWOLF TARGET DISPLAY



Seawolf's Target Display consists of the Fire Control map, the Tube Selection Panel and the Target Designation and Preset Panel. From the Target Display the weapon in a specific tube is targeted at a specific contact and weapon presets appropriate for the target are entered.



The Fire Control map is covered in Fire Control Suite/Fire Control Map on p. 115. The rest of Seawolf's Target Display is described here.

Tube Selection Panel

The lower left of the Target Display contains the Tube Selection Panel. A number represents each of the Seawolf's eight torpedo tubes. Following each number are two small display windows. The lower window, the Weapon window, displays the name of the weapon loaded in the tube. The upper window, the Target window, displays the Contact ID or target assigned to the weapon. Dashes indicate that no target is assigned to the weapon in that tube.

- Click a tube number to select it.

NOTE: TLAMS and SLMMs are not assigned Contact IDs. Waypoints are placed on the map for the weapon to follow. **WYPT** appears in the Target Window when waypoints have been assigned to TLAMS or SLMMs. A UUV is a sensor and can not be assigned a target.



Target Designation and Presets Panel

The upper right side of the Target Display contains the Target Designation and Presets Panel. The following options are available.

Center OS: When this option is selected the map symbol for Ownship is always centered in the Fire Control map when the map is zoomed in.

Weapon Waypoints: When ON, all waypoints assigned to any land attack missile or mine display on the map. When this option is OFF only the waypoints for the weapon in the selected tube show on the map.

Designate Target: All Contact IDs are listed in the drop-down list by their alphanumeric Contact IDs.

NOTE: No Contact IDs appear in this list if Show Truth is on or if you have not yet marked any contacts with one of your sensors.

Assign Target: Click this button to assign the contact selected in the Designate Target drop-down list to the tube selected in the Tube Selection Panel.

The lower portion of the panel displays the presets for the weapon in the selected tube. Presets vary depending on the weapon. See *Fire Control Suite/Presets* on p. 113.

To assign a contact to a tube:

1. Click the desired contact symbol on the Fire Control map or select the contact ID from the **Designate Target** drop-down list.
2. Click the number of a tube containing a weapon appropriate for the target. (If the weapon you need is not loaded in a tube, go to the Launch Panel and load the desired weapon. See *Seawolf Launch Panel* on p. 118.)
3. Click **ASSIGN TARGET**. The Contact ID appears in the Target Window.
4. Presets for the weapon in the selected tube appear in the lower portion of the Target Designation and Preset panel. Adjust as needed. For information on preset settings see *Fire Control Suite/Presets* on p. 113.

To assign waypoints to a TLAM or SLMM

1. Select a tube containing a TLAM or SLMM.
2. Click **DEFINE TARGET WAYPOINTS** in the preset area.
3. Click the Fire Control map to place the waypoints.
4. Click and drag a waypoint as needed to adjust its location and enter a destruct range for the weapon. (For specific information see *Fire Control Suite/Presets* on p. 113.)

To launch a UUV sensor:

1. Select a tube containing a UUV.
2. If a depth other than Ownship depth is desired, deselect Use OS Depth in the Preset Panel and enter the exact depth you want in the Depth preset that appears..
3. Launch the UUV from the Launch Panel

Once targets and presets are assigned, click the Launch Panel icon and fire the weapon from the Launch Panel.

Sub Command Tip: Once weapons are assigned to a tube, the tube can be fired from any station by using the Orders menu>Fire Tube option in the Task Bar.

Torpedo Wire Guide Controls

Once a torpedo is fired, its symbol appears on the Fire Control map. When the weapon enables, two red lines extend from the torpedo symbol indicating the weapons search cone. Until a torpedo enables, it can be wire-guided.

- Click the torpedo's Fire Control map symbol.

The following Wire Guide Controls appear in the Preset area.

Heading: Click the right facing arrow to increment the weapon's ordered heading. Click the left facing arrow to decrease the ordered heading.

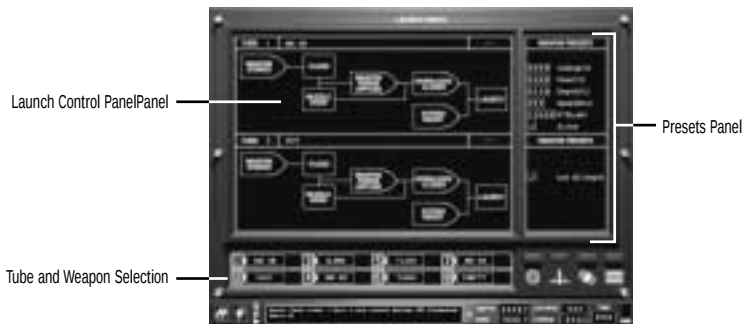
Enable: Click to enable the weapon before it reaches the enable distance set in the *Run to Enable* preset.

Pre-Enable: Click to return an enabled weapon to its pre-enabled state without shutting the weapon down entirely. If you want to wire guide a weapon that has already enabled, click this option. The red enable cone disappears.

Shutdown: Click to shut down the weapon entirely. The weapon can not be enabled again if this option is selected.

SEAWOLF LAUNCH PANEL

The Launch Panel is composed of the Launch Control Panel, the Tube and Weapon Selection Panel and the Presets Panel.



Launch Control Panel

The Launch Control Panel displays Launcher Controls for the two selected tubes. Above each Launcher Control is the Tube Status Bar containing the tube number, the name of the weapon loaded and the assigned target. The two tubes that display here are selected by clicking on a pair of tube numbers in the Tube and Weapon Selection Panel below.

Tube and Weapon Selection Panel

Clicking on a tube number in the Tube and Weapon Selection Panel selects that tube number as well as the one above or below it and displays the Launcher Controls for the selected tubes in the Launch Control Panel. From the Tube and Weapon Selection Panel you can also change the weapon assigned to a specific tube. The name of the weapon currently loaded in the tube displays in green following each tube number.

Presets Panel

The presets for the weapons in the adjacent Launch Control Panel display in the Preset Panel. Presets entered from the Target Display are viewed here and can be adjusted if desired prior to weapon launch.

To launch a weapon:

1. In the Tube and Weapon Selection Panel click the number of the tube you want to fire. The tube's Launcher Controls display in the Launch Control Panel.

NOTE: Only rectangular buttons are selectable at various stages in the launch procedure. A green outline around a rectangular button indicates it can be selected at this stage of the launch sequence. Selected buttons flash until the indicated process is complete.

2. Click **FLOOD**. This button initiates the process that floods and equalizes the tube. When the tube is flooded the **FLOOD** button text is green. Reselecting this button at this point reverses the process.
 3. Click **MUZZLE DOOR** to open the muzzle door. The button flashes until the door is open. The **SYSTEM READY** buttons turns green and the **LAUNCH** button is selectable.
 4. Click **LAUNCH** to fire the weapon
- To Wire Guide a torpedo return to the Target Display and select the torpedo symbol on the Fire Control map.

NOTE: If the Launch button is not selectable make sure there is a target assigned to the tube. Also check the High-Pressure Air bank in Ship Control. A weapon launch requires a charge of at least 50% in your air banks. If you have fired numerous weapons or performed an emergency main ballast tank blow, your air bank may be depleted and must be recharged. See *Ship Stations/Ship Control* on p. 52.

To reload a tube after firing:

Before you can reload a tube you must first close the muzzle door and remove the water in the torpedo tube.

- Click **MUZZLE DOOR** to close the muzzle door and drain the tube. Follow the steps below for loading a new weapon.

NOTE: Closing the muzzle door cuts the wire on the torpedo or UUV launched from the tube. Wire guiding is no longer possible and you no longer receive sonar reports from the UUV once the wire is cut.

To change the weapon loaded in a tube:

1. Click the name of the weapon in the tube you want to reload. (If the tube has been fired, click Empty.) Repeated clicks cycle through all the weapons available for loading in this tube.
 2. Stop clicking when you see the name of the weapon or UUV you want to load.
- If you click an empty tube and the weapon names do not cycle, the muzzle door for that tube is still open. Click **MUZZLE DOOR** of the empty tube. This closes the muzzle door and removes the water from the tube in preparation for reload.

NOTE: The unload/load process takes approximately twenty minutes. Loading an empty tube takes 8-10 minutes depending on the submarine. If **Fire Control Quick Launch** is selected in the Options>Game screen the Unload/load time is cut to forty seconds and loading an empty tube is cut to 20 seconds.

The Unload/Load Process

If the tube's number is selected while it is being reloaded, you notice the **WEAPON STOWED** indicator blinks in the tube's Launch Control Panel. The name of the weapon originally loaded in the tube displays in the Tube Status Bar while the name of the weapon to be loaded appears in the Tube and Weapon Selection Panel.

Once the original weapon is unloaded the name of the weapon being loaded displays in the Tube Task Bar and the Target Assignment is cleared. (You must reassign a target to the new weapon from the Target Display.) The presets for the new weapon appear in the Presets Panel. The reload process is not complete until the Weapon Stowed indicator stops blinking.

Sub Command Tip: Be very careful where you click in the Tube and Weapon Selection Panel. If you intend to select the tube number but click the weapon name instead, you start a reload of that tube. A reload time consuming!

SEAWOLF: COUNTERMEASURE LAUNCH PANEL



Active and passive decoys are available in external and internal tubes. The loadout in the Seawolf's external countermeasure tubes can only be changed from Weapons Loadout Screen prior to starting a mission. Internal tubes can be loaded during gameplay as long as countermeasures are available.

The Seawolf's Countermeasure Launch Panel consists of The External Tubes Launch Controls, the Internal Tubes Launch Controls, the Presets Panel, the External Tube Presets Selector, and the Internal Tube Preset and Countermeasure Selector.



External Tubes Launch Controls

Each external tube can contain two countermeasures. In *Sub Command* you can launch each of these separately. The upper and lower Launch buttons correspond to the upper and lower countermeasures named above the Launch buttons.

To launch a countermeasure:

1. In the Internal or External Tubes Presets Selector click the number of the tube you want to fire. (The tube number above or below the selected tube is also selected.) The presets for the selected tubes appear in the Presets Panel.
2. Use *OS Depth* is selected by default. To enter an exact depth for the countermeasure deselect Use *OS Depth* to display the *Depth* preset. Click the digits in the *Depth* preset to increment the value. Right-click to decrease the value.
3. Find the desired tube number in the Countermeasure Launch Controls Panel and click **LAUNCH**. Launch buttons outlined in green can be fired. An orange outline indicates that the tube is empty.
4. If the tube fired was an internal tube, reload the tube.

To reload or change the CM loaded in an internal tube

- In the Internal Tubes Presets and Countermeasure Selector click **EMPTY** or the name of the countermeasure you want to change and continue to click to cycle through the available options.

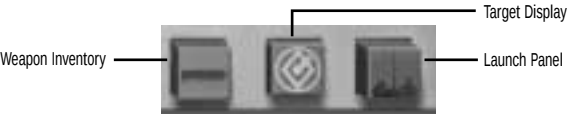
SEAWOLF: WEAPON INVENTORY



The Weapons Inventory simply displays the current type and number of weapons on board your sub. No interaction is possible. The numbers decline as appropriate each time a weapon or countermeasure is dispensed.

688(I): FIRE CONTROL SUITE

The 688(I) has three stations in its Fire Control Suite; the Target Display, the Launch Panel and the Weapons Inventory. These stations are reached by clicking one of the buttons at the bottom of the Fire Control Stations. The buttons look the same but button locations vary from station to station.



688(I): TARGET DISPLAY



The 688(I) Target Display consists of the Fire Control map, the Target Selection list, the Tube Selection Panel and the Map Control Panel. The Fire Control map is described in *Ship Stations/Fire Control Suite/Fire Control Map* on p. 115.



Map Control Panel

In addition to the map controls described in *Ship Stations/Fire Control Suite/Fire Control Map* on p 115, the 688(I) has map control buttons to zoom in and pan the map display.

Weapon Tracks: When ON all waypoints assigned to any land attack missile or mine display on the map. When this option is OFF only the waypoints for the weapon in the selected tube show on the map.

Center on Ownship: When this button is depressed the Ownship symbol is centered in the Fire Control map when the map is zoomed in.

Target Selection List

This drop-down list contains all of the contacts currently designated in the game. The Contact ID selected in this list is available for assignment to a specific tube as described in *To assign a contact* to a tube: below.

Tube Selection Panel

From the Tube Selection Panel contacts are assigned to specific tubes and weapon presets are entered, the torpedo wire guide controls are also accessed from this panel.

A number represents each of the 688(I)'s twelve vertical Launch System (VLS) tubes and four torpedo tubes. The VLS tubes occupy the upper portion of the Tube Selection Panel and are numbered 8 – 15. Torpedo tubes are numbered 1 through 4. Dashes beneath any tube indicate that no target has been assigned to the tube.

To see what weapon a tube contains click the P (Presets) button below the tube's number to display the presets and weapon loaded. You can also switch to the launcher panel where all tube weapon assignments are visible.

To assign a contact to a tube:

1. Select the desired Contact ID from the **Target Selection** dropdown or click a contact on the Fire Control map to automatically select it in the list.
2. Click the number of a tube containing a weapon appropriate for the target. The contact ID appears below the tube number indicating this contact is now assigned to this tube.
3. Click **P** below the tube number to display the presets for the weapon. For information on all presets see *Ship Stations/Fire Control Suite/Presets* on p. 113
4. When presets are entered click the Launch Panel icon to access the Launcher Controls.
5. Once a torpedo has been launched click the **W** button to display the Wire Guide Controls.

NOTE: Contacts can be assigned to a Vertical Launch tube if a TASM is loaded. If a TLAM is loaded in the tube waypoints must be set. See *To assign Waypoints to a TLAM or SLMM* on p. 123.

Torpedo Wire Guide Controls

Once a torpedo is fired, its symbol appears on the Fire Control map. When the weapon enables, two red lines extend from the torpedo symbol indicating the weapon's search cone. Until a torpedo enables, it can be wire-guided.

- Click the torpedo's Fire Control map symbol to display the wire guide controls.

Heading: Click the right facing arrow to increment the weapon's ordered heading. Click the left facing arrow to decrease the ordered heading.

Enable: Click to enable the weapon before it reaches the enable distance set in the *Run to Enable* preset.

Pre-Enable: Click to return an enabled weapon to its pre-enabled state without shutting the weapon down entirely. If you want to wire guide a weapon that has already enabled, click this option. The red enable cone disappears.

Shutdown: Click to shut down the weapon entirely. The weapon can not be enabled again if this option is selected.

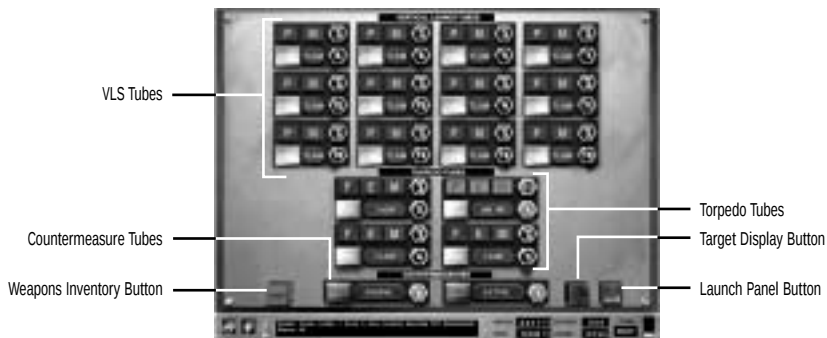
To assign waypoints to a TLAM or SLMM:

1. Click the **P** under a tube containing a TLAM or SLMM. The weapon presets are displayed.
2. For a TLAM, enter a destruct range for the weapon. See *Land Attack Missile Presets* on p. 113.
3. For both TLAM and SLMM click **ASSIGN TARGET WAYPOINTS** then click the Fire Control map. Four waypoints are placed for a TLAM, one waypoint for a SLMM.
4. Enter exact coordinates in the Latitude and Longitude presets or click and drag the waypoint to the desired location. Watch the latitude and longitude readout in the lower left corner of the Fire Control map as you drag the waypoint to determine its current location.

688(I): LAUNCH PANEL



From the Launch Panel weapons selected in the Target Display are launched.



To launch a weapon from the torpedo tubes:

1. Once you have assigned a target to a torpedo tube in the Target Display, find that tube number in the Launch Panel.
2. Click **F** to flood the tube. The light flashes, then stays lit.
3. Click **E** to equalize the water pressure in the tube.
4. Click **M** to open the muzzle door. The **I** lights up, indicating that the interlocks have been met to fire the weapon and the tube number lights up.
5. Click **FIRE** once to lift the cover; click again to fire the weapon.

6. If you fired a torpedo and you want to wire guide it, return to Target Display and click **W** next to the number of the tube you fired. **W** stands for wire guidance. See 688(I) *Target Display/Wire Guide Controls* on p. 121.

To reload a torpedo tube

Only torpedo tubes can be reloaded when underway.

- If the weapon name display reads Empty, click to load a weapon. Repeated clicks cycle through available weapons.
- To change the weapon loaded in a tube click the weapon name until the desired weapon name appears.

The tube's number light flashes until the weapon reload is complete.

- If you click an empty tube and the weapon names do not cycle, the muzzle door for that tube is still open. Click the **M** button to close the muzzle door and try again. Remember that closing the muzzle door cuts the wire on torpedoes and UUVs.

NOTE: The unload/load process takes approximately twenty minutes. Loading an empty tube takes 8-10 minutes depending on the submarine. If the Fire Control Quick Launch option is selected in the Options>Game page the unload/load time is cut to forty seconds and loading an empty tube takes 20 seconds.

To launch missiles from Vertical Launch Tubes:

1. In the 688 TLAMs and TASMs can be fired from the Vertical Launch Tubes.
2. After you have assigned waypoints for a TLAM or assigned a target to a tube containing a TASM, locate that tube number in the Launch Panel.
3. Click **P** to pressurize the tube.
4. Click **M** to open the muzzle door. The **I** lights up, indicating that the inter-locks have been met to fire the weapon and the tube number lights up.
5. Click **FIRE** once to lift the cover, then click again to fire the weapon.

NOTE: Remember, you can only load Vertical Launch tubes when you're in port! You can't reload once you're underway.

NOTE: If a tube number does not light up and the Fire button does not respond, make sure there is a target assigned to the tube. If a target is assigned check the High-Pressure Air bank in Ship Control. A weapon launch requires a charge of at least 50% in your air banks. See *Ship Stations/Ship Control* on p. 52.

To launch Countermeasures:

1. Click **FIRE** to open the cover, then click again to fire the countermeasure.
2. To reload or load a different type of countermeasure click the empty text or weapon name and continue clicking to cycle through the available options.

688(I): WEAPON INVENTORY



The Weapons Inventory simply displays the current type and number of weapons on board your sub. No interaction is possible. The numbers decline as appropriate each time a weapon or countermeasure is dispensed.

AKULA: FIRE CONTROL SUITE

The Akula's Fire Control Suite consists of the Target Display, the Launch Panel and the Weapons Inventory. These stations are reached by clicking one of the buttons at the bottom of the Fire Control Stations.



AKULA: TARGET DISPLAY



The Akula Target Display consists of the Fire Control map, the Target Selection List, the Tube Selection Panel and the Map Control Panel. The Fire Control map is described in *Ship Stations/Fire Control Suite/Fire Control Map* on p. 115.



Map Control Panel

In addition to the map controls described in *Ship Stations/Fire Control Suite/Fire Control Map* on p 115, the Akula has map control buttons to zoom in and pan the map display.

Weapon Tracks: When this button is ON (lit) all waypoints assigned to any land attack missile or mine display on the map. When this option is OFF (dark) the button is dark and only the waypoints for the weapon in the selected tube show on the map. Click to toggle the state of this button.

Center on Ownship: When this button is ON (lit) the Ownship symbol is centered in the Fire Control map when the map is zoomed in.

Target Selection List

This drop-down list contains all of the contacts currently designated in the game. The Contact ID selected in this list is available for assignment to a specific tube as described in *Tube Selection Panel/To assign a contact to a tube* below.

Tube Selection Panel

From the Tube Selection Panel contacts are assigned to specific tubes and weapon presets are entered. The torpedo wire guide controls for the Internal Tubes are also accessed from this panel. A number represents each of the Akulas eight internal torpedo tubes and six external torpedo tubes.

NOTE: The Akula has a double-hull construction. The tubes referred to as external tubes are external to the pressure hull and cannot be reloaded when the sub is underway. The internal tubes are accessed from within the pressure hull and can be reloaded.

The eight internal tubes consist of four 53 cm tubes numbered 1 through 4 and four 65 cm tubes numbered 5 through 8. The internal tubes occupy the upper portion of the Tube Selection Panel. The lower portion of the panel contains the six external tube selectors numbered 1 through 6.

To assign a contact to a tube:

1. Select the desired Contact ID from the Target Selection List or click a contact on the Fire Control map to automatically select it in the list.
2. Click the number of a tube containing a weapon appropriate for the target. The contact ID appears below the tube number indicating this contact is now assigned to this tube.
3. Click **P** below a tube number to display the presets for the weapon. For information on all presets see *Ship Stations/Fire Control Suite/Presets* on p. 113
4. When presets are entered click the Launch Panel icon to access the Launcher Controls.
5. Once a torpedo is launched from one of the internal tubes click the **W** button to display its Wire Guide Controls.

Torpedo Wire Guide Controls

Once a torpedo is fired, its symbol appears on the Fire Control map. When the weapon enables, two red lines extend from the torpedo symbol indicating the weapon's search cone. Until a torpedo enables, it can be wire-guided.

- Click **W** below the desired tube to wire guide the torpedo from that tube. The **W** is only selectable if the tube has fired a torpedo that can be wired guided.

Heading: Click the right facing arrow to increment the weapon's ordered heading. Click the left facing arrow to decrease the ordered heading.

Enable: Click to enable the weapon before it reaches the enable distance set in the *Run To Enable* preset.

Pre-Enable: Click to return an enabled weapon to its pre-enabled state without shutting the weapon down entirely. If you want to wire guide a weapon that has already enabled, click this option. The red enable cone disappears.

Shutdown: Click to shut down the weapon entirely. The weapon can not be enabled again if this option is selected.

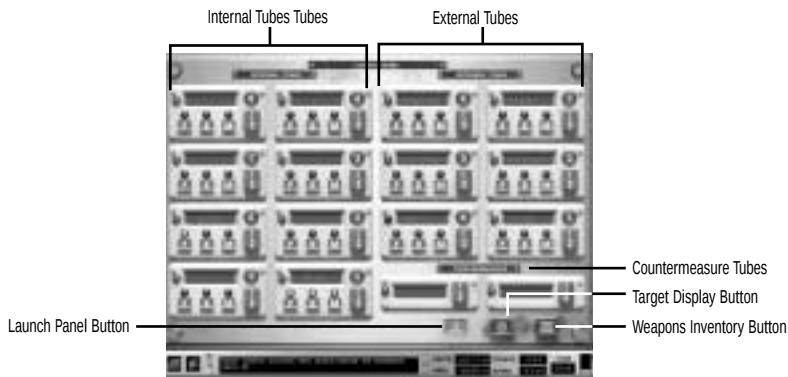
To assign waypoints to a SS-N-27 LAM or Mobile Mine:

1. Click the **P** under a tube containing a SS-N-27 LAM or a Mobile Mine. The weapon presets are displayed.
2. For the land attack missile (LAM) enter a destruct range for the weapon. See *Land Attack Missile Presets* on p. 113 or *Mine Presets* on p. 114
3. For both SS-N-27 LAM and Mobile Mine click **ASSIGN TARGET WAYPOINTS** then click the Fire Control map. Four waypoints are placed for a SS-N-27 LAM, one waypoint for a Mobile Mine.
4. Enter exact coordinates in the *Latitude* and *Longitude* presets or click and drag the waypoint to the desired location. Watch the latitude and longitude readout in the lower left corner of the Fire Control map as you drag the waypoint to determine its current location.

AKULA: LAUNCH PANEL



From the Launch Panel weapons selected in the Target Display are launched.



To launch a weapon from the torpedo tubes:

1. Once you have assigned a target to a torpedo tube in the Target Display, find that tube number in the Launch Panel.
2. Click **F** to flood the tube. The yellow light above the button flashes, then stays lit.
3. Click **E** to equalize the water pressure in the tube.
4. Click **M** to open the muzzle door. The tube number lights up.
5. Click **FIRE** to lift the cover; click again to fire the weapon.
6. When the tube is empty, the red light to the left of the weapon name window goes dark.
7. If you fired a torpedo and you want to wire guide it, return to the Target Display screen and click the **W** next to the number of the tube you fired. **W** stands for wire guidance. See *Akula Target Display/Wire Guide Controls* on p. 125.

NOTE: 53-65K torpedoes are wake homers and can not be wire guided in *Sub Command*.

To launch a UUV:

Because a UUV is a sensor, not a weapon, it need not be assigned a target in the Target Display to be fired. The tube is fired as described above.

1. If you want to launch the UUV to a depth other than Ownship depth, first select the tube containing the UUV in the Target Display and click **P** to display its presets.
2. Click the checkmark to deselect *Use OS Depth* and display the *Depth* preset.
3. Click a digit to increment its value. Right-click to decrease the value.

To reload a torpedo tube:

Only internal torpedo tubes can be reloaded when underway.

- If the weapon name display reads Empty, click to load a weapon. Repeated clicks cycle through available weapons.
- To change the weapon loaded in a tube click the weapon name until the desired weapon name appears.

The red light to the left of the weapon name flashes until the weapon reload is complete.

- If you click an empty tube and the weapon names do not cycle, the muzzle door for that tube is still open. Click **M** to close the muzzle door and wait until the tube is no longer flooded, then reload the tube. Remember that closing the muzzle door cuts the wire on torpedoes and UUVs.

NOTE: The unload/load process takes approximately twenty minutes. Loading an empty tube takes 8-10 minutes depending on the submarine. If the **Fire Control Quick Launch** option is selected in the Options>Game screen the unload>load time is cut to forty seconds and loading an empty tube takes 20 seconds.

NOTE: If a tube number does not light up and the Fire button does not respond check to make sure there is a target assigned to the tube. Also check the High-Pressure Air bank in Ship Control. A weapon launch requires a charge of at least 50% in your air banks. For information on how to charge your air banks see *Ship Stations/Ship Control/Ship Control Tasks* on p. xxx.

To launch countermeasures:

1. Click **FIRE** to open the cover, and click again to fire the countermeasure.
2. To select a different countermeasure or load an empty tube click the name of the countermeasure. Continued clicks cycle through the available options.

AKULA WEAPON INVENTORY



The Weapon Inventory simply displays the current type and number of weapons on board your sub. No interaction is possible. The numbers decline as appropriate each time a weapon or countermeasure is dispensed.

RADAR STATION



Submarine radar is used exclusively when the sub is at periscope depth or when the sub is surfaced. Unlike the periscope, radar works well in foggy conditions. Radar should be used with caution. When you use radar you communicate four things to other ships in the area whether they are friendly, neutral, or hostile:

- Your presence. If you had been operating covertly up to this point, you no longer are.
- Your bearing. Any ships that picked up your emission are immediately aware of your bearing to them.
- Your proximity. Other ships may not know the exact range to your submarine, but the relative strength of your signal will give them a general idea of your proximity.
- Who you are. Ships with ESM capability can quickly determine that you are a U.S. or Russian submarine by analyzing your signal.

Marking contacts with radar:

The radar station operations are the same on all subs.

3. Ensure that you are at Periscope Depth or less and moving at 8 kts or less if the sail is submerged.
 4. Click **RAISE** in the Radar Mast panel to raise the mast. The Ready light glows when the radar mast is extended and radiating.
 5. Contacts show up as bright spots on the display. Drag the cursor and center it on a contact.
 6. Click **MARK** to send the contact's bearing and range to TMA and the Nav map.
 7. Click the desired range scale and/or range rings spacing.
 8. Click **OFF** in the Range Rings toggle switch to disable range rings altogether
- NOTE:** Radiating while submerged destroys your radar.



Seawolf Radar Station



688(I) Radar Station



Akula Radar Station

RADIO ROOM / ESM STATION



In Sub Command the Radio Room and ESM (Electronic Support Measures) stations are combined. The radio is used to receive intelligence and tasking updates while ESM allows you to detect and classify contacts when at periscope depth.

RADIO MESSAGES

The radio is your link with the outside world. At the beginning of each mission, you should always review your current mission orders and check for any new intel or tasking messages. Incoming messages can provide crucial updates on targets. This information can include extremely helpful information on a target's last known position and even its estimated course and speed.

To receive messages you must raise the radio mast or stream the floating wire antenna. There are advantages and disadvantages to both modes. The floating wire receives messages far more slowly than the radio mast, but the wire can be used under ice and you don't have to be at periscope depth to use it.

While the mast collects signals quickly, you must be at periscope depth to use it. Because it protrudes from the water, the radio mast creates a wake that can be seen by aircraft and provides a surface that can be detected by enemy radar.

There are speed restrictions when using either the wire or the radio mast.

- **Radio Mast:** You must be at periscope depth and at 8 kts or less when the sail is submerged to avoid damaging the mast.
- **Floating Wire:** You must not exceed 18 kts or damage occurs. Make sure the wire is streamed to at least half of its length in order to ensure message reception.

RECEIVING RADIO MESSAGES

To receive a message:

1. Select either the floating wire antenna or the radio antenna mast to receive the message.

Seawolf

- **Radio Mast:** Under Radio Antenna click the + (Raise) side of the button. The text flashes green until the mast is fully extended then remains green until the mast is lowered.
- **Floating Wire:** Click right-facing double arrows to stream the floating wire. A progress bar indicates how much of the wire is currently deployed. Click the square (Stop) button to stop the winch. Click the left-facing arrows to retrieve the array.



688(I):

- **Radio Mast:** Click **RAISE** above the toggle switch to raise the Radio Antenna mast.
- **Floating Wire:** Click **STREAM** to deploy the Floating Wire Antenna.

Akula:

- **Radio Mast:** In the Radio Antenna panel click **RAISE** to extend the Radio Mast. The green light flashes until the mast is fully extended then glows steadily.
 - **Floating Wire:** In the Floating Wire panel click **STREAM**. A progress bar below the switch indicates the length of the wire that is currently deployed.
2. Look at the message screen for incoming messages. A scroll bar appears in the message window if there are more messages than can be displayed at one time. The newest message traffic is always at the bottom of the scrolling text. Message traffic may not appear immediately. When a message is received, the Receive or Incoming Message button glows briefly.
 3. After a message has been received, lower the Radio Mast.

NOTE: Radio message text also appears in the Radio History Window on the Task Bar. When a new message is received, the radio history selection button (the blue square) on the Task Bar flashes until the button is selected. You can raise and lower the radio mast from the Task Bar's Orders menu from any screen.

ELECTRONIC SUPPORT MEASURES (ESM)

The ESM mast is designed for the passive detection of radar emissions. This sensor detects any platform in your area that is employing radar. When the Mast is raised, a contact appears on the circular ESM Display as a bright wedge extending from the center of the display to the bearing indicator at the display's outer edge. The intensity of the signal is usually an indication of the contact's proximity to your ship. The ESM Indicator lights indicate the strength of the signal and move from green to red as the signal strength grows.

In addition to the contact's bearing, ESM can also tell you the type of ship that is radiating. Your ship's computer analyses the transmission and compares it to those in its database.

Because you must be at periscope depth and the ESM mast is exposed, you make your ship vulnerable to detection when using ESM. Be sure to minimize the amount of time your ESM mast is exposed.

DETECTING AND CLASSIFYING CONTACTS WITH ESM

To use ESM:

1. **Raise the ESM mast to activate the ESM system.** Remember that you must be at periscope depth and at a speed of 10 kts or less if the sail is submerged.

Seawolf

- Under **ESM Antenna** click the **+** (Raise) side of the button. The text flashes green until the mast is fully extended then remains green until the mast is lowered.

688(I):

- Under ESM Antenna click **RAISE** above the toggle switch to raise the ESM Antenna mast. The red light is lit when the mast is raised.

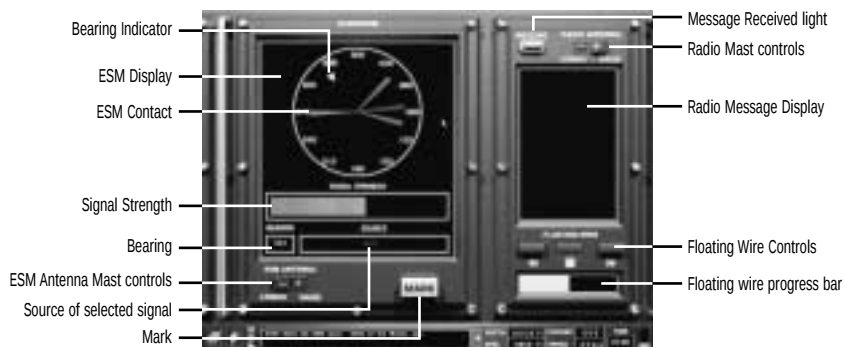
Akula:

- On the ESM Antenna panel click **RAISE** to extend the Radio Mast. The switch moves to that position. A green light flashes until the mast is fully extended then glows steadily.

2. Determine the bearing and classification of the contact.
 - Click the contact signal in the ESM Display to determine contact bearing and to view the source of the signal (e.g. Kirov, Helix, etc.). You can also click and drag the triangle cursor around the bearing indicator to center it on a contact.
 - The bearing of the contact appears in the Bearing field.
 - The class name of the contact appears in the Source field. It may take one or more sweeps of the display before the class is identified.
3. **Estimate the proximity of the contact.** Take note of the intensity of the contact on the ESM Display and the number of ESM Indicator lights that are lit. A strong signal can indicate that the contact is relatively close.
4. **Send the bearing data to the TMA station.**
 - When the cursor is centered on a signal, click **MARK**. This assigns an alphanumeric contact ID to the contact and sends it to TMA and the Nav map. ESM contacts have E designations (E01, E02, etc.)

SEAWOLF: RADIO/ESM STATION

The Seawolf's Radio/ESM Station is described below. The use of these features is described in *Radio/ESM Station/Receiving Radio Messages* starting on p. 131.



ESM Display: Contacts display on the bearing at which they are detected. The triangle cursor selects a contact when centered on the bearing of the contact.

Signal Strength: The strength of the signal is represented as a series of colored bars that move from green to red as the signal increases in strength.

Bearing: Readout of the bearing at the position of the triangle cursor in the ESM Display.

Source: The class name of the source of the signal at the cursor location.

ESM Antenna: Click **RAISE** or **LOWER** to extend or lower the ESM mast.

Mark: Clicking here to sends the bearing of the selected contact to TMA and the Nav map. ESM contacts have **E** designations.

Receive: When a new message is received this light glows briefly.

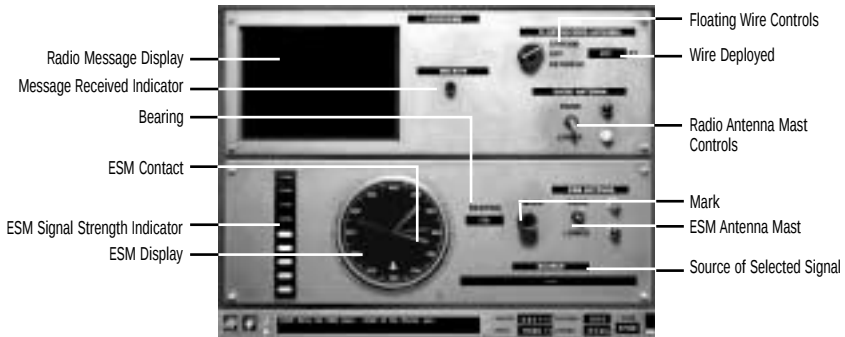
Radio Antenna: Click **RAISE** or **LOWER** to extend or lower the Radio mast.

Radio Message Display: All radio messages display in this scrolling window. Scroll to the bottom to see the newest message.

Floating Wire: Click the right-facing double arrow to stream the floating wire. Click the left-facing double arrows to retrieve the floating wire. Click the square (Stop) button to stop the winch. The portion of the wire currently deployed is depicted in the progress bar.

688(I): RADIO / ESM STATION

688(I)'s Radio/ESM Station is described below. The use of these features is described in Radio/ESM Station/Receiving Radio Messages starting on p. 131.



Radio Message Display: All radio messages display in this scrolling window. Scroll to the bottom to see the newest message.

Receive: When a new message is received this light glows briefly.

Floating Wire: Click **STREAM** to deploy the floating wire antenna. Click **OFF** to stop the winch. Click **RETRIEVE** to retrieve the wire. The length of wire currently streamed is shown in feet to the right of the switch.

Radio Antenna: Click **RAISE** or **LOWER** to extend or lower the Radio Antenna mast.

ESM Antenna: Click **RAISE** or **LOWER** to extend or lower the ESM Antenna mast.

ESM Signal Strength Indicator: These lights indicate the strength of the signal and ascend from green to red as the signal grows in strength.

ESM Display: Contacts display on the bearing at which they are detected. The triangle cursor selects a contact when centered on the bearing of the contact.

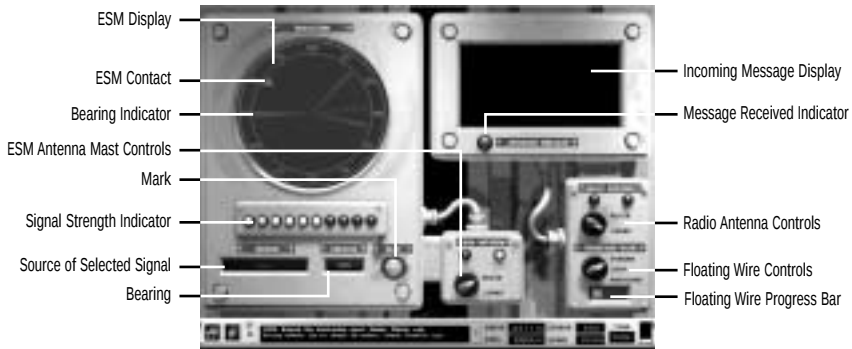
Bearing: Displays the bearing at the location of the cursor on the ESM Display.

Mark: Clicking here sends the bearing of the selected contact to TMA and the Nav map. ESM contacts have **E** designations.

Source: Displays the class name of the signal source designated by the triangle cursor.

AKULA: RADIO / ESM STATION

The Akula's Radio/ESM Station is described below. The use of these features is described in *Radio/ESM Station/Receiving Radio Messages* starting on p. 131.



ESM Display: Signals (contacts) display on the bearing at which they are detected. The triangle cursor selects a contact when centered on the bearing of the contact.

Signal Strength Indicator: The strength of the signal is represented as a series of colored lights that illuminate from green to red as the signal increases in strength.

Source: Displays the class name of the signal source designated by the triangle cursor.

Bearing: Displays the bearing at the location of the cursor on the ESM Display.

Mark: Clicking here sends the bearing of the selected contact to TMA and the Nav map. ESM contacts have E designations.

ESM Antenna: Click **RAISE** or **LOWER** to extend or lower the ESM Antenna mast.

Incoming Message: All incoming message traffic displays in this scrolling window with new messages following older ones.

Radio Antenna: Click **RAISE** or **LOWER** to extend or lower the Radio Antenna mast.

Floating Wire: Click **STREAM** to deploy the floating wire antenna. Click **OFF** to stop the winch. Click **RETRIEVE** to retrieve the wire. The progress bar below the switch represents the amount of wire currently streamed.

PERISCOPE AND STADIMETER STATIONS



Periscopes on modern submarines are highly sophisticated pieces of equipment. Many subs carry both a search periscope and a short-range attack periscope. *Sub Command* merges several capabilities into a single periscope on each controllable submarine.

In addition to a Low Light Television (LLTV) which enhances your ability to see contacts at night, the periscope also has an ESM sensor. This sensor is omni-directional and indicates the presence of radar signals in the area as well as a general level of signal strength.

Visual contacts provide a wealth of information. Bearing is known immediately upon sighting. Additional analyses of the contact with the Stadimeter can provide an accurate range to the target as well as its classification. Used together the periscope and Stadimeter can provide the contact's bearing, range and course, three of the four elements needed for a target solution. You still need to determine the contact's speed. If you have classified the contact using the Stadimeter, you can easily estimate the speed using the sonar's DEMON function. See *Ship Stations/Sonar/DEMON SONAR Station* on p. 77.

The Stadimeter Station is used to determine the range, course and classification of visual contacts. Once you have taken a photo of the contact from the periscope, you can identify and classify the contact with the Stadimeter. The Stadimeter can also be used to estimate a surface ship's range. A contact's course can be determined by observing the target aspect or angle on the bow (AOB).

Since an exposed periscope generates a wake, using the periscope raises the likelihood that your ship could be spotted from the air. It can also provide a radar return to ships in the area. Another disadvantage of using the periscope is that it has a relatively short range, approximately 3.5 n.m. Most likely you will detect the contact with one of your other sensors before you would be able to see it in the periscope.

Periscope depth varies for the controllable sub classes in *Sub Command*.

- **Seawolf:** 69 feet
- **688(I):** 65 feet
- **Akula:** 16 meters

Your speed should not exceed 10 knots when your scope is raised and your sail is submerged or you risk damaging the mast.

DETECTING CONTACTS WITH THE PERISCOPE

Press **¥** to move to the Periscope Station.

1. Ensure the ship is at periscope depth and your speed is within the designated parameters.

Periscope depths and maximum speeds are as follows:

- **Seawolf:** 69 feet, 10 kts or less if the sail is submerged.
- **688(I):** 65 feet, 10 kts or less if the sail is submerged.
- **Akula:** 16 meters (53 feet), 10 kts or less if the sail is submerged.

2. Raise the periscope. Wait a moment as the periscope is raised.

Seawolf:

- Click **RAISE** on the orange bar at the top of the screen. The Raise text flashes green until the scope is fully raised then remains green.

688(I):

- Click base of the Raise/Lower toggle switch on the side associated with the desired state. The green light indicates that the scope is lowered. The red light flashes until the scope is fully raised then remains red until the scope is lowered.

Akula:

- A green light indicates that the scope is fully lowered. Click **RAISE**. The red light flashes until the scope is fully raised then the light remains red.

3. When operating at night, switch to Low Light Level TV (LLTV). This mode enhances your night vision.

Seawolf:

- Click the **LLTV** button. The button label is green when LLTV is on.

688(I):

- Click **LLTV** on the toggle switch in the upper right of the station.

AKULA:

- Click **LLTV** on the switch above the periscope view.

4. Rotate the periscope to look for contacts. Make use of the periscope's ESM sensor as you rotate the scope. This sensor can alert you to the presence of a contact before you can see it in the periscope view. The lights of the ESM sensor illuminate from green to yellow to red depending on the proximity of the contact. Green indicates that the contact is far away.

Seawolf:

- Use the left and right pointing arrows on outer ends of the periscope handle or click and drag inside the view to rotate the scope 360°.

- The ESM indicator is located above the periscope view.

688(I):

- Click the Pan buttons on the left periscope handle or click and drag in the screen to rotate the periscope 360°.

- The ESM indicator lights are located to the right of the periscope view.

Akula:

- Click the red arrows on the left and right periscope handles, or click and drag in the periscope view to rotate the periscope 360°.

- The ESM indicator is a vertical stack of lights to the left of the periscope view.

5. Zoom and adjust your view. Center the view on the contact of interest. Zoom in and adjust the elevation as needed.

Seawolf:

- Click the plus and minus buttons on the right periscope handle to zoom in and out on the view.
- Click the up and down arrow buttons on the left periscope handle to adjust the elevation in the view. You can also click and drag in the periscope view to adjust the elevation.

688(I):

- Click the Zoom buttons on the right periscope handle to zoom in and out in the periscope view.
- Click the Elev buttons on the left periscope handle or click and drag in the periscope view to adjust the elevation seen there.

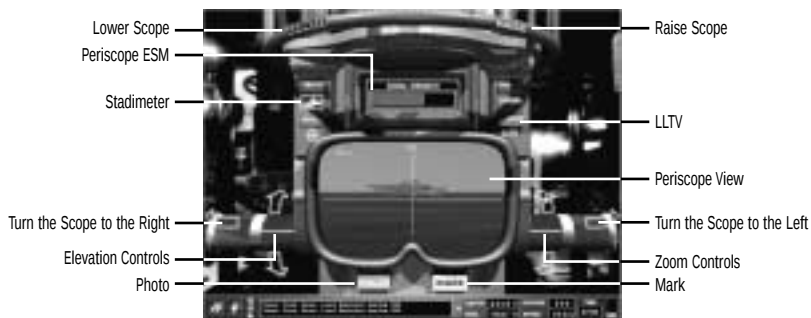
Akula:

- Click the upper half of the Zoom crank **TAB** zoom out. Click the lower half of the crank to zoom in.
- 6. Mark the contact. Marking the contact assigns it an alphanumeric designation and sends the bearing information for the visual sighting to the Target Motion Analysis station. Visual contacts have a V designation. (V01, V02 etc.)
- In all submarines, click **MARK**.
- 7. Take a photo of the contact for use in Stadimeter. Center the contact in the middle of the periscope view. Align the horizontal line with the waterline before you take the picture.
- In all submarines, click **PHOTO**.

NOTE: If you are within three nautical miles of a land contact when you mark it with the periscope it is classified by the game and you can target it with land attack missiles. If you see buildings through the periscope and are not able to mark them even when you are inside the three nautical mile range, the building is not a simulation object and cannot be marked. Buildings must be designated as simulation objects when the mission is designed. See *Mission Editor/Object Properties Panel/Building Properties* on p. 182.

SEAWOLF: PERISCOPE STATION

The Seawolf's Periscope Station is described here. For step by step instructions on using the Periscope see *Periscope Station/Detecting Contacts with the Periscope* on p. 136.



Lower: Click this text to lower the periscope.

Raise: Click this text to raise the periscope.

Stadimeter Button: Click to move to the Stadimeter Station. Make sure that you photograph the contact before going to the Stadimeter.

Visual: Selects visual mode for the periscope view for daylight viewing.

LLTV: Low Light Television allows you to see contacts more clearly at night. Click this button to activate LLTV.

Periscope View: The bearing you are viewing displays at the top of the Periscope View. The zoom, or level of magnification, is noted in the upper left corner of the view.

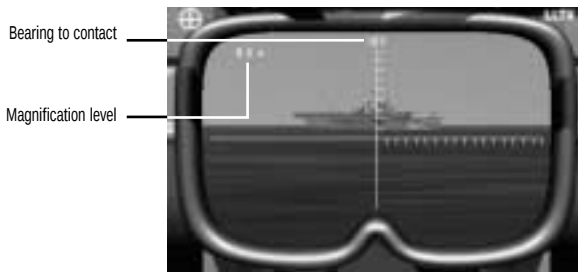


Photo: Take of photo of the visual contact or use in the Stadimeter.

Mark: Assigns an alphanumeric Contact ID to the contact and sends the contact's bearing information to TMA and the Nav map.

Pan Left/Right Arrows: Clicking these controls move the periscope horizontally 360 degrees.

Elevation Control Arrows: Controls the vertical view in the periscope.

Zoom Control Arrows: Zooms in and out on the periscope view. 1x, 2x, 4,x and 8x are available.

688(I) PERISCOPE STATION

The 688(I)'s Periscope Station is described here. For step by step instructions for using the periscope see *Periscope Station/Detecting Contacts with the Periscope* on p. 136.



Periscope View: A readout of the bearing you are viewing displays at the top of the Periscope View. The zoom, or level of magnification, is noted directly below the bearing readout.

Visual/LTV: Select visual mode for daytime or Low Light Television mode for night use.

Raise/Lower: Toggles the state of the periscope mast.

ESM Indicator: Indicates the presence of radar emissions on a given bearing.

Pan View: Moves the view in the periscope view horizontally 360 degrees.

Elevate View: Controls the vertical view in the periscope.

Photo: Click to take a photograph of the contact in the periscope view for use in Stadimeter.

Periscope Button: The depressed and orange highlighting indicates that the Periscope Station is selected.

Stadimeter Button: Click to move to the Stadimeter Station.

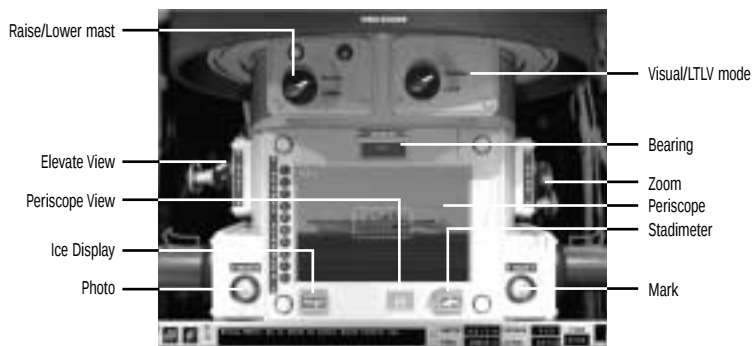
Mark: Assigns an alphanumeric Contact ID to the contact and sends the contact's bearing information to TMA and the Nav map.

Zoom: Zooms in or out on the periscope view.

Ice Display Button: Moves to the upward looking television used on the 688 to determine the thickness of ice.

AKULA: PERISCOPE STATION

The Akula Periscope Station is described below.



Raise/Lower: Raises or lowers the periscope mast.

Visual/LLTV: Click the desired text to select visual mode for daytime or Low Light Television (LLTV) mode for night use.

Elev: Click the handle of the crank to move the view up or down.

ESM Indicator: Indicates the presence of radar emissions on a given bearing.

Bearing: Displays the bearing currently at the center of the periscope view.

Periscope View: The level of magnification appears in the upper left corner when the scope is raised and the bearing appears above the view.

Zoom: Click the handle of the crank to zoom in or out on the periscope view.

Photo: Click to take a photograph of the contact in the periscope view for use in Stadimeter.

Ice Display Button: Click here to move to the Under Ice Display.

Periscope Button: The depressed red state indicated that the Periscope station is selected.

Stadimeter Button: Click here to move to the Stadimeter Station.

Mark: Click here to assign an alphanumeric Contact ID to a contact and send bearing information to TMA and the Nav map.

STADIMETER STATION



Using a photo of a contact taken through the Periscope, the Stadimeter allows you to classify the contact as well as determine its range and course.

NOTE: The Stadimeter can only be accessed from the Periscope Station.

- Press  to reach the Periscope Station, then press the Stadimeter button.

When the Stadimeter appears, the last photo you took through the periscope appears in a window. Your ship's computer scans its database of silhouettes and creates a list of those classes that have a length close to that of the ship in the photograph. The ships that fit this criterion can be selected one at a time and their silhouettes viewed and rotated in the Silhouette Window.

Manipulating the photo allows you to determine the contact's range. Finding a 3D silhouette that matches the photo allows you to classify the contact. Rotating the 3D silhouette to closely match the aspect seen in the photo helps you determine the AOB. When you know the bearing to the contact and the AOB, you can fairly accurately determine its course.

DETERMINING COURSE WITH STADIMETER

When you know the bearing to the contact and the AOB, you can obtain a fairly accurate determination of its course by doing some simple arithmetic. The Seawolf does the math for you and simply presents you with the contact's course. In both the 688(I) and the Akula you must do the arithmetic for yourself.

Assume you have a contact bearing 235 and you have determined the class of the ship and located the ship's silhouette in the Stadimeter. Once you have rotated the 3D silhouette until the view of the model matches the aspect seen in the photo, you know the AOB for the contact. (This number appears in the AOB field.) Assume that the AOB of the contact is port 42. This is all the information you need to determine the contact's course.

1. Find the reciprocal of the bearing to the contact. This is the contact's bearing to you. In our example the reciprocal of 235 is 55. Follow these steps to determine the reciprocal.
 - If the bearing to the contact is 0 – 180 **add** 180 to the bearing number.
 - If the bearing to the contact is 180 – 360 **subtract** 180 from the bearing number.
2. Once you have determined the reciprocal of the bearing to the contact, add or subtract the number in the AOB window as shown below.
 - If the contact has a **port** aspect, **add** the number in the AOB window to the reciprocal.
 - If the contact has a **starboard** aspect, **subtract** the number in the AOB window from the reciprocal.
3. If the resulting number is greater than zero and less than 360, this is the course of the contact. In our example the reciprocal is 55 and the AOB is 45. The contact's course is 100.
 - If the number is **greater** than 360, **subtract** 360. The resulting number is the contact's course.
 - If the number is **less** than zero, **add** 360 to it. The resulting number is the contact's course.

Because the interfaces for Stadimeter are quite different, instructions for using this feature on each controllable sub are covered separately below.

SEAWOLF: STADIMETER STATION



Classifying a Contact with the Stadimeter

Once you have a photograph of a contact, find a 3D-silhouette that matches it.

1. From the **Country** drop-down list select a country name. Ships in that country's Order of Battle that are similar in length to the contact in the photo are listed in the Class list.
2. Select a ship class name from the **Class** drop-down list. A 3-D silhouette of that class appears in the Silhouette window.
3. Rotate and zoom the model. Click the arrows on either side of the AOB window to rotate the model in the Silhouette window until it matches the AOB of the contact in the photo. This can better help you determine if this silhouette is a match. Click the Zoom buttons to alter the size of the silhouette in the window.
4. Continue the search. Continue to cycle through the countries and classes until you find a silhouette that matches. The name listed in the Class window identifies the class of the contact.

Determining a Contact's Range with the Stadimeter

1. Adjust the photo. Click the side of the photo containing the contact's highest mast and drag that side of the photo such that the top of the highest mast is even with the waterline on the other half of the photo. The estimated range to the ship is displayed in the Range window.
2. Mark the contact. Once you have determined the contact's range, click **MARK** to send the contact's bearing and range to TMA.

Determining a Contact's Course with the Stadimeter

1. Locate the correct silhouette. Click through the available models until you find one that matches the contact in the photo.
 2. Match model aspect to photo aspect. Using the AOB arrows, rotate the model until the aspect in the photo matches that of the model.
- The contact's course is now shown in the Course window.

NOTE: The contact's course is not sent to TMA when Mark is clicked. You must enter the course in TMA yourself.

688(I): STADIMETER STATION



Classifying a Contact with the Stadimeter

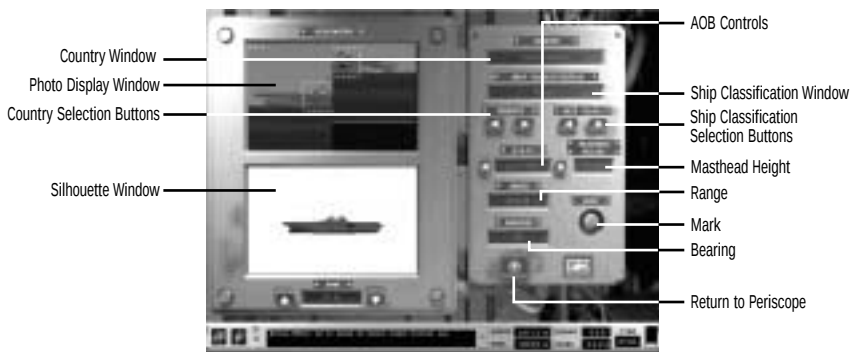
1. Select a class. Click **BACK** and **NEXT** to view a different platform class name in the Ship Silhouette list. A 3-D silhouette of that class appears in the Silhouette window.
2. Rotate and zoom the model. Click **PORT** and **STBD** to rotate the aspect of the 3D model in the Silhouette window until it matches the position of the contact in the photo. This can better help you determine if this silhouette is a match. Click the Zoom buttons to alter the size of the silhouette in the window.
3. Continue the search. Continue to cycle through classes until you find a silhouette that matches. The name listed in the Ship Silhouette window identifies the class of the contact.

Determining a Contact's Range with the Stadimeter

1. Adjust the photo. Click the Image Adjust buttons to separate the two halves of the image. Adjust the image such that the top of the highest mast is even with the waterline on the other half of the image. The estimated range to the ship is displayed in the Range (Yds) display.
2. Mark the contact. Once you have determined the contact's range, click **MARK** to send the contact's bearing and range to TMA and the Nav map.

NOTE: To determine the contact's course see *Determining Course with Stadimeter* on p. 141

AKULA: STADIMETER STATION



CLASSIFYING A CONTACT WITH THE STADIMETER

1. Click the Country arrows to select a country name in the Country window. Any ships in that country's Order of Battle that are similar in length to the contact in the photo are available for selection in the Class window. If the selected country has no ships that fit the criterion, the Class window is blank.
2. Click the Ship Class arrows to cycle through the ship classes from the selected country that match the length criterion of the ship in the photo. The name of the selected class appears in the Ship Classification window. A 3-D silhouette of that ship class appears in the Silhouette window.
3. Rotate the model. Click the arrows on either side of the A.O.B. (Angle on the Bow) window to rotate the model in the Silhouette window until it matches the AOB of the contact in the photo. This can better help you determine if this silhouette is a match.
- Click the Zoom buttons to alter the size of the silhouette in the window.
4. Continue the search. Continue to cycle through the countries and classes until you find a silhouette that matches. The name listed in the Ship Classification window identifies the class of the contact.

Determining a Contact's Range with the Stadimeter

1. Adjust the photo. Click the side of the photo containing the contact's highest mast and drag that side of the photo such that the top of the highest mast is even with the waterline on the other half of the photo. The estimated range to the ship is displayed in the Range window.
2. Mark the contact. Once you have determined the contact's range, click **MARK** to send the contact's bearing and range to TMA and the Nav map.

NOTE: To determine the contact's course see *Determining Course with Stadimeter* on p. 141.

UNDER ICE DISPLAY

All controllable subs in *Sub Command* are capable of operating and surfacing when under the ice. The basic under-ice operating procedures are the same regardless of the submarine class you are commanding and are covered in *Special Operations and Procedures/Under Ice Operations* on p. 152. The use of the Under Ice Display to locate polynyas is covered here.

In order to surface when under the ice it is necessary to locate an area of thin ice or open water called a polynya. In *Sub Command*, each class of submarine uses different equipment to locate an appropriate place to surface. These are covered separately below.

In *Sub Command*, all controllable submarines are given equal under ice capabilities. No one hull is stronger than another. Surfacing or attempting to surface in ice that is too thick can cause damage to your ship.

ICE THICKNESS	DAMAGE
---------------	--------

0-4 feet:	No Damage to Ownship.
4-8 feet:	Minor damage (May lose ice sensors).
8-12 feet:	Moderate damage. May lose masts.
> 12 feet:	Flooding possible.

SEAWOLF: UNDER ICE DISPLAY

The Seawolf's Under Ice Display is incorporated into the ship's Trim Display in the Ship Control Station. A profile of the ice thickness above Ownship is represented across the top of the Trim Display. If you change your course, the display instantly updates to display the ice thickness on the new course.

688(I): UNDER ICE DISPLAY

The 688(I) utilizes an upward looking television camera to assist in locating suitable locations for surfacing when under the ice. Suitable areas appear brighter while areas where the ice is very thick appear dark. Because the TV relies on differences in brightness it is not helpful at night. The Signal Strength Indicator uses colored lights to indicate the thickness of ice directly over Ownship as follows.

Green: 0-4 feet thick

Yellow: 4- 8 feet thick

Red: 8- 12 feet or more.

AKULA: UNDER ICE DISPLAY

The Akula's High Frequency Display utilizes an upward looking High Frequency Acoustic Sensor and a Signal Strength Indicator to help determine ice thickness. In Upward Looking mode, the display window red indicates ice and black indicates no ice. The display is never a solid red when ice is present but has a mottled look displaying various shades of red. The darker areas are locations of thinner ice. The representation of ice at the center of the display indicates the ice directly over Ownship.

The row of colored lights beneath the display window is the Signal Strength Indicator. The strength of the signal returning from your acoustic Sensor indicates the thickness of the ice directly above Ownship. Signal strength is represented as a color indicating ice thickness as shown below.

Green: 0-4 feet thick

Yellow: 4- 8 feet thick

Red: 8- 12 feet or more

The Akula's forward looking High Frequency Active Sonar (HFAS) shares this display screen.

- Click **UPWARD LOOKING** in the Alignment Panel to view the Ice Display/
- Click **FORWARD LOOKING** to view HFAS returns. For information on marking contacts with the HFAS see *Ship Stations/Sonar/Active Sonar/Akula: High Frequency Active Sonar* on p. 91.

AUTO CREWMEN

Auto Crewmen can be turned on or off on the Options>Crew page at any point during gameplay or from any station that has an Auto Crewman. See below. The proficiency of all Auto Crewmembers is approximately 85 %. Your crew is not infallible!

To turn an Auto Crewman on or off:

- In Options>Crew click in the box in front of the desired crewmember. A checkmark indicates the crewman is on. Click in the box again to toggle its state.
- Click the text of the station name. If that station has an automated crewman, the cursor turns to a finger. Click the text to activate the crew for that station. The text changes to indicate that the station is automated. Click again to deactivate the crewman.

NOTE: Auto Crewmen are on by default if Novice setting was selected at installation or enabled in the Options>Crew page. To successfully play from the Nav Station, all Auto Crew should be enabled.

SONAR AUTO CREWMAN

- **In Narrowband:** Assigns trackers, classifies all marked contacts in Narrowband and assigns a Low, Medium, or High level of confidence in his classification. The level of confidence displays in the Navigation Station's DDI and above the 3D model when that contact is selected.

Low level of Confidence: Crewman has narrowed the possible classes to 4 or more and picks one at random.

Medium Level of Confidence: Crewman has narrowed the possible classes to 2 or 3 and picks one at random.

High Level of Confidence: Crewman has narrowed the possible classes to one.

The Auto-Sonarman searches Narrowband for contacts. Because they share trackers, contacts marked in Narrowband also display in Broadband.

In Broadband: Tracker letters for contacts marked in Narrowband appear above the contact (in Seawolf, 688(I) or inside the contact peak (Akula) in the Broadband Displays.

When the auto crewman is ON you can still mark contacts yourself and select different arrays and contacts for the crewman to analyze.

- **On the Nav Map:** Each contact marked by your Sonar Auto Crewman appears on the Nav map as a colored line of bearing ending with a symbol. This is usually the symbol for Unknown (platform type)/Unknown (alliance) and is accompanied by its contact designation number (S01, S02, etc). As soon as your Sonar Auto Crewman has classified the contact, the symbol changes to that of the specified class. (See *Ship Stations/Navigation Station/Contact Symbols* on p. 43.) Clicking on the contact designation displays information about the class in the DDI and the 3D model of that class appears in the 3D view surrounded by a bounding yellow bounding box and a level of confidence bar.

- **Your task:** Your Sonar Auto Crewman can classify a contact as a specific class, but he can not determine its alliance. You must do that yourself on the Nav map.
- On the Nav map, right-click the contact's symbol to display the Contact menu.
- Select Designate Type/Alliance>Alliance and drag your cursor to select the presumed alliance for the contact.

TMA AUTO CREWMAN

Accurate TMA takes time. Your TMA Auto Crewman requires data from several sensors and/or a change in Ownship's course to generate an accurate firing solution. Reports from multiple sensors (for example both the towed and sphere arrays) increase his accuracy as well as the speed at which he creates a firing solution.

The TMA Auto Crewman performs the following duties.

- Uses information reported from all sensors to determine a firing solution. This solution is his best estimate of the course, bearing, range and speed of a contact.
- Merges contacts that represent the same track reported by different sensors.
- Keeps track of the movement of each contact and updates the solution on the Nav and Fire Control Maps with every new sensor input. The solution is updated immediately with his best guess whenever a contact is selected from the drop-down list in the TMA station.
- Once the crewman enters a solution for a contact, the contact then appears as a symbol on the Nav map at the designated range and bearing and the solution is also sent to Fire Control for use in targeting. The symbol for Unknown (platform type)/Unknown (alliance) is displayed until you or the Sonar Auto Crewman classifies it.
- The Nav map symbol for the contact moves on the map according to the course and speed set in the solution.
- **Accuracy:** Approximately 85%.

NOTE: When TMA Auto Crewman is on, you can select specific contacts to view on the TMA board, but you are not able to manipulate the ruler or the settings. If you move the ruler your crewman moves it back to the position he selected.

FIRE CONTROL AUTO CREWMAN

The Fire Control Auto Crewman performs the following duty.

- Uses information sent from the TMA station to establish presets for selected weapon appropriate for the designated target.
- **Your Task:** It is still your responsibility to select a target, assign a tube, and fire the weapon from the Fire Control Launch Panel or by using the Contact menu's Engage With command from the Nav. Your Fire Control Auto Crewman uses the contact's classification when determining presets. If you classify a contact as a surface ship when in actuality it is a submarine, you Auto Crewman enters presets appropriate for a surface ship.

NOTE: When the Fire Control Auto Crewman is ON you can set only Snapshot bearings and place waypoints in the presets. All other presets are grayed out.

RADAR AUTO CREWMAN

You must raise and lower the radar mast. Your Radar Auto Crewman performs the following task as long as the radar is on.

- Marks contacts and re-marks them every minute that the contact can be detected. Contact range and bearing is sent to TMA and is reported on the Nav screen DDI when that contact is selected.

NOTE: The Radar Auto Crewman is not speedy. It takes a minute or two before he begins to mark contacts. When Radar Auto Crewman is ON, you cannot move the Radar cursor.

AUTO-HELMSMAN

The Auto-helmsman is turned on automatically whenever Ownship waypoints are placed on the Nav map. There is no selection for Auto Helmsman in the Options>Crew page. Your Auto Helmsman does the following when waypoints are placed.

- Follows waypoints in order until they are completed or the player orders a course change.
- Maintains the defined course regardless of changes in depth or speed.
- Once the sub reaches the last waypoint, he continues to steer the ship on its current course until you order a new one.
- If you order a course change before all waypoints have been reached, a menu item appears on the right-click Ownship menu. Select **RESUME WAYPOINT FOLLOW** to order the Auto-Helmsman to resume following the waypoints.

NOTE: A waypoint is reached once the sub arrives within a 100-yard radius of the waypoint.

SPECIAL OPERATIONS AND PROCEDURES

On occasion you may be tasked with an Under Ice Operation or be called upon to mine a harbor or deliver a Special Forces team to a specific location. Special Operations and procedures for deploying specialized sensors are covered in this chapter.

DEPLOYING AND RECOVERING SPECIAL FORCES

Special Operations Forces, called in this manual a Special Forces team, are carried by all controllable subs. A team can be launched one time over the course of a mission. Some missions specifically call for you to launch and retrieve your Special Forces team. If you have *not* been given specific instructions on how, when and where to retrieve your SF team, you can only *launch* the team, not *retrieve* them.

When your team is launched they proceed to the designated target. If the Show Truth option is not on, your SF team does not appear on the Nav map. If all goes well, the designated target is destroyed shortly after the arrival of your team. Be aware that patrol craft and aircraft can kill your team.

NOTE: If Show Truth is on, the Nav map symbol for the Special Forces team and the Special Forces 3D object disappear when the team arrives at the target.

TO LAUNCH SPECIAL FORCES TEAM

Special Forces are launched from the Nav map at a specific surface or land target. Ownship speed must be at 3 kts or less and you must be at periscope depth or less.

- Right-click the desired target to display the Contact menu. If Ownship is at periscope depth and has a speed of 3 kts or less, the Deploy Special Forces option is available in the Contact menu's Engage With menu option.
- Select **DEPLOY SPECIAL FORCES**. Your Executive Officer notifies you when the team is away.

NOTE: The Deploy Special Forces menu option only appears when all of the following parameters are met. The SF team is still on board; Ownship is traveling at 3 kts or less; Ownship is at periscope depth or less; you are viewing the Contact menu for a surface platform, or land site. (Special Forces cannot be deployed against air or submarine platforms.)

TO RETRIEVE SPECIAL FORCES TEAM

When you are directed to retrieve a Special Forces team, maneuver the ship to the ordered location at the specified time and maintain the speed as designated in your tasking message.

- While mission-specific instructions may vary, generally your speed must be 3 kts or less and you must be at periscope depth or less.
- To locate your team, you may need to use your radar and your periscope and maneuver as close as possible to the raft.
- When you are within the time, speed and location parameters specified in your tasking message, the XO notifies you that the Special Forces are onboard.

DEPLOYING UUVs

Unmanned Underwater Vehicles (UUVs) are used in Sub Command as remote sonar sensors. Merging TMA bearing information provided by a remote sensor with data from your ship's sensors can provide a fairly accurate assessment of the range to the contact. UUVs are particularly useful when navigating minefields.

UUVs are launched from the Fire Control Station and are wire-guided like torpedoes. A UUV is very quiet once deployed but launching one is just as noisy as launching a torpedo.

Passive sonar mode is on by default when a UUV is launched but active sonar mode can be enabled at any time as long as the wire is still attached and the battery is functioning. Sonar returns cease as soon as you cut the wire or after the UUV's thirty-minute battery is depleted. Since UUVs can not be retrieved, you need only close the muzzle door to cut the wire and jettison the UUV. The tube can then be re-loaded. Altering Ownship's course by more than 90° cuts the wire.

Sonar returns from the UUV are automatically assigned a Contact ID and can be found in the TMA **Select** drop-down list and on the Nav and Fire Control maps. UUV sonar returns do not show up on any of the screens of the Sonar Suite although the UUV itself displays as a contact in Broadband and Narrowband Sonar.

- A contact detected by a UUV in passive mode appears on the Nav map as an Unknown/Unknown symbol at the end of a white line of bearing that extends from the location of the UUV at the time of the report. The line of bearing has a default range of 10 n.m.
- A contact detected by a UUV in active mode appears as an Unknown/Unknown symbol at the end of a green line of bearing. The length of the LOB indicates the range of the contact from the UUV.

TO LAUNCH A UUV

1. Set Ownship speed to 4 kts or less.
2. Select a tube containing a UUV and initiate the launch procedure. (For information on launching weapons see Ship Stations/Fire Control/Launch Panel for your specific sub class.)
 - By default the UUV launches on the same course and depth as Ownship.
 - To set a specific depth, click *Use OS Depth* to deselect it. The *Depth* preset appears. Click the digits in the *Depth* preset to set a specific depth.

Wire Guiding UUVs

Seawolf:

- Select the UUV symbol on the Fire Control map to display the wire-guide controls in the Preset Panel You may have to zoom way in to be able to select the UUV symbol.
- Click the Ordered Course arrows to adjust the course of the UUV.

688(I) and Akula

- In the Fire Control Target Display click **W** beneath the tube number of the tube that fired the UUV to display the wire guide controls.
- Click the Ordered Course arrows to adjust the course of the UUV.

NOTE: Depending on its course, the UUV may provide returns on Ownship.

TO ENABLE UUV ACTIVE SONAR

- UUVs are in passive mode when launched. However, active sonar may be necessary when traversing a minefield. Be aware that capable ships and subs in the area can detect UUV active sonar. Follow these steps to enable UUV active sonar.
1. Enable the wire guide controls for the UUV as described above.
 2. Click **ENABLE** to initiate active sonar.
 3. Click **PRE-ENABLE** to de-activate active sonar and return to passive mode.

LAYING MINES

Because of a submarine's ability to operate covertly in littoral waters, laying mines is a useful application of a submarine's capabilities. Today's mines can be fired from torpedo tubes and travel several miles to a specified location. This allows mines to be placed in areas too shallow to be accessed by a submerged submarine.

A successful mine insertion requires careful planning. The crew must determine how many mines are to be placed and their precise locations. Which tubes will be used and the order in which the tubes will be fired along the launch course must also be carefully planned. Timing and teamwork are important. Keeping the submarine exactly on the launch course is the responsibility of the navigation party. The reload party must reload the tubes as quickly as possible. Once a tube is reloaded, the fire control party must ensure that the correct inputs have been entered for the next mine to be launched before the ship reaches that mine's launch point.

In *Sub Command* a single waypoint is set for each mine and the exact latitude and longitude coordinates are entered in the mine's waypoint presets. Since it takes as long to load a mine as it takes to load a torpedo (eight to ten minutes) you should begin the reload process as soon as a mine is launched.

TO LAY A MINEFIELD

1. Check your tasking or determine the exact latitude and longitude for each mine to be placed.
2. From the Launch Panel, load the desired tubes with mines.
3. Determine which tube will fire the mine destined for each specific location.
4. Select each tube individually and place a waypoint for that mine to follow. Select the waypoint and drag it to the desired location using the lat/long readout at the bottom of the Fire Control map. You can also enter the desired latitude and longitude in the waypoint presets.

Seawolf:

- Click the waypoint on the Fire Control map to display the waypoint preset panel

688(I) and Akula:

- The waypoint presets appear below the Define Target Waypoint button in the preset panel a soon as the waypoint is placed on the map.

Sub Command Tip: Once mines are loaded and and presets are entered, you can fire the tube from the Nav map using the Ownship or Orders Menus. Map Markers can be placed on the Nav map indicating the mine location and a launch point for the mine designated for that location. Using this method you can better tell when to fire the tube. See *Navigation Station/2D Map/Map Menu* on p. 41.

5. After firing the mine, reload the tube with a new mine or weapon.

DSRV RESCUES

The Deep Submergence Rescue Vehicle (DSRV) is designed to 'mate' with submarines from various nations in emergency situations. In *Sub Command*, the DSRV can be assigned to all controllable subs but only appears on a sub if the sub has been tasked to use it in the current mission. Carried on the back of the host submarine, the DSRV is launched when within range of the submarine to be rescued.

NOTE: The DSRV is launched using the Spec Ops>Deploy DSRV options from the Contact menu of a submerged submarine. These menu options are only available when Ownship has met certain speed and depth requirements.

To Launch the DSRV:

1. When within range of the submarine to be rescued order Ownship to 3 kts or less.
 2. Ensure that Ownship depth is greater than periscope depth.
 3. Right-click the submarine to be rescued. From the Contact menu select **Spec Ops** then **Deploy DSRV**. (See Note above.) The DSRV detaches from Ownship and moves slowly toward the selected submarine. Your Executive Officer (XO) informs you when the DSRV has deployed.
- Be aware that it is possible to deploy the DSRV to rescue any submarine, not just the one in distress. Be sure that you have identified the proper submarine to rescue.

To Recover the DSRV:

Once the DSRV has completed its assignment it leaves the area of the downed submarine and returns to the location where it was deployed.

1. Maneuver your sub close to the DSRV or wait at the location where it was deployed for it to come to you.
2. Maintain a speed of 3 kts or less and remain below periscope depth.
3. The XO informs you when the DSRV is once again mated to your hull.

UNDER ICE OPERATIONS

Operating a submarine under the ice is a dangerous evolution. Much of the ocean floor is still poorly charted in the far northern latitudes, requiring that a sub crew pay close attention to their fathometer and sonars to avoid running into uncharted sea mounts. Outcroppings of ice, known as keels, can extend downward from the ice sheet for hundreds of feet, creating hazards for the submarine's sail, hull and propeller. Avoiding situations that could cause flooding, fire or damage to the propeller is a top priority for a Captain during under ice operations.

Surfacing when under the ice is much different than surfacing in open water. Crews undergo special training to learn and practice the nuances of the procedure. In order to surface safely the crew uses an upward-looking ice profiling sonar or similar device to locate a polynya, which is an open or thin area in the ice, and surfaces the ship there.

When a polynya is located, it is carefully searched to ensure that there are no ice keels that could damage the ship. The submarine is brought to a complete stop, carefully positioned under the polynya, then trim and buoyancy are adjusted to slowly bring the ship up and through the ice. Hitting the ice too hard or at the wrong angle can damage the ship, or perhaps worse, the propeller, leaving the submarine with difficult task of traveling thousands of miles home without its main propulsion.

TO SURFACE AND SUBMERGE UNDER THE ICE

The procedure for surfacing and submerging under the ice is the same for all controllable subs.

1. Using your ship's Ice Display locate a polynya in the ice. (See *Ship Stations/Under Ice Display* on p. 145 for your specific sub class to learn how to locate a polynya.)
2. At a slow speed position yourself under the polynya then bring the sub to a complete stop.
3. From the Orders menu select Navigate>Set Depth>Surface or set your depth at the surfaced depth for your submarine.

Seawolf: 39 feet

688(I) 32 feet

Akula: 9 meters

- You can tell that the ship has surfaced by selecting Ownship and looking in 3D view. The ship's sail emerges through the ice.
 - For those who prefer not to use the 3D view, check the depth readout to determine that you are surfaced. See the numbers above to determine surfaced depth for your sub.
 - Once surfaced you can raise the periscope and view the ice field. Be sure to lower your periscope again before submerging to avoid damaging it.
4. To submerge the ship again, maintain a speed of zero and order a depth well below the thickness of the ice. Be sure to first retract any masts you may have raised!

MULTIPLAYER

Sub Command allows you to host or join multiplayer games either on a local area network or over the Internet. As host you decide the mission title, which options are available, and the players in the mission.

Online gameplay for *Sub Command* will be available only through August 31, 2002 subject to online terms of use and all features may not be available at the time of purchase. Please check online at <http://www.ea.com> for more information and terms of use.

CONNECTING

Click **MULTIPLAYER** in the Main menu to display the Multiplayer Screen.

- Click **CONNECTIONS** (the connected computers icon button) then **OK** to view custom connection options.
- Click **EA.COM** then **OK** to reach EA.COM's Matchup *Sub Command* Matchup Web site.
- Click **WWW** then **OK** to view available web links.

Up to eight players can connect via LAN/Internet or EA.COM's Matchup service.



TO HOST AN IPX OR TCP/IP GAME

As Host you select the mission, players and options available to all players.

1. From the Main menu, click **MULTIPLAYER** to reach the Multiplayer Screen.
2. From the Multiplayer screen click **CONNECTIONS** (computers) then click **OK**. The Connections screen appears listing two options: IPX or TCP/IP
3. Select the desired type of connection then click **OK** to enter the Lobby.

LOBBY

1. Click **HOST**. Host options appear on the Multiplayer screen.
2. Enter a name for your game in Session Name. If desired, select Require Password to Connect then enter a password in the Password field.

Sub Command Tip: Be sure to share the password with fellow players prior to starting the mission.

3. Click **OK** to enter the Game Room.

GAME ROOM: HOST OPTIONS

As players join the game their names appear in the Name column of the Game room.

1. Click **MISSION SELECTION** to display the Multiplayer Missions screen.
 - Select a mission from the list of titles. The number of players in a mission is shown before the mission title.
 - Select a submarine to command from the Controllable Sub Selector and Specific Sub Selector list. For information on submarine selection see *Main Menu/Missions* on p. 20.
 - Click **OK** to apply your selection and return to the Game Room.
2. Brief and Weapon Loadout buttons are now selectable and the name of the submarine you selected appears in the Platform column.
 - Click **BRIEF** to read the tasking for this mission.
 - Click **WEAPON LOADOUT** to adjust your sub's loadout based on the tasking.
3. The Host determines which options are allowed in a multiplayer game. Click **OPTIONS** to set the options that are available to all players in this multiplayer game. See *Multiplayer/Multiplayer Options* on p. 157.
 - Click **OK** to apply your selections and return to the Game Room.
 - Click **CANCEL** to return to the Game Room without changing any Options.
4. When all desired players have joined and indicate they are ready to start, click **PLAY**.
5. To deny game access to a specific player, select the player's name then click **REFUSE PLAYER**.



TO JOIN A IPX OR TCP/IP GAME

1. From the Main menu, click **MULTIPLAYER** to reach the Multiplayer screen.
2. Click **CONNECTIONS** (computers) then click **OK**. The Connections screen appears listing two options: IPX or TCP/IP.
3. Select the desired type of connection then click **OK** to enter the Lobby.

LOBBY

The Join option is selected by default.

- The Sessions window displays the names of hosted games. The selected name is highlighted.
- The Players window displays the names of those players connected to the selected session.
- If the host has selected a mission, a description appears in the Mission Description window.
- The letter **Y** appears after a game name under the padlock icon if a password is required to join the selected game. An **N** indicates that no password is required.
- Under Player/Max the number of players currently connected is followed by the total number of controllable submarines in the mission.
- The Ping rate to the host is shown in the PING column.

1. Click the name of the game you want to join.
2. Click **OK** to enter the Game Room.



GAME ROOM: JOIN OPTIONS

Once the Host has selected a mission, the options at the left of the screen are selectable.

1. Click **PLATFORM SELECTION** to select a submarine to command in the Mission. The Multiplayer Missions screen appears.
 - From the Controllable Sub Selector, select a controllable sub.
 - When you have made your sub selection click **OK** to return to the Game Room.
2. Click **OPTIONS** to select or view the Multiplayer options allowed by the Host. Set any allowable options in the Game and Crew Option pages as desired.
3. Click **BRIEF** to read the tasking for this mission.

4. Once you have selected a sub to command click **WEAPON LOADOUT** to adjust your sub's loadout.
 - Click **OK** in the Weapon Loadout screen to accept any changes you want to implement. Click **CANCEL** to negate any changes you made.
5. Click **READY** to notify the host you are ready to play.



MULTIPLAYER MATCHUP GAMES

1. From the Main menu select **MULTIPLAYER**. The Multiplayer screen appears.
2. Click **EA.COM** then click **OK** to launch your Internet browser. You are connected to the EA.COM *Sub Command* Multiplayer Matchup Web site.
3. Click **LOGIN TO PLAY**. Provide your name and password. If you do not have one, click **JOIN** and register.
4. Once you are logged in, click **MATCHUP**. The Lobby screen appears.
 - If *Sub Command* updates are available a pop-up window provides an opportunity to download them.
5. In the Lobby screen, click **CREATE GAME**.
6. Set the Room Name, Greeting, Password, Min. Game players, Max. Game Players (8), and Game Room Capacity.
7. Click **OK**. You enter the Game Room. Three Tabs are available. Game Room, (where you are) Tools and Game Settings.

Game Settings: These Settings are identical to the ones described in Multiplayer Options below.

Game Tools: Click a player name then select any of these options as desired: Ban Player, Unban Player, Boot Player, Make into Host, and Unready player.
8. When all players click **READY** the host may click **START GAME** to launch the game.



MULTIPLAYER OPTIONS

In the Game Room click **OPTIONS** to display the Multiplayer Options page. From here the host sets specific options that are available to all players. Only the host can set options in the Multiplayer Options page but those joining the game can view the Multiplayer Options page to see which options the host has set and allowed.

The host can:

- force all players to use specific options.
- prevent all players from using specific options.
- allow players to use specific options if they so choose.

The Multiplayer Options page contains two columns of check boxes.

If the host checks a box in the first column it indicates his desire to control the option setting that follows in that row. The second column contains check boxes associated with options from the Game, Crew and 3D pages.

When the host selects a box in the Controlled by Host column he can either force or prevent the player from using the option that follows in that row.

If the host does not select a box in column one, the joining player is free to set the option in that row from the appropriate Option page if he so desires.

CONTROLLED BY HOST:	SETTINGS:
----------------------------	------------------

- | | |
|------------------|--|
| Checked : | All players forced to use this option. |
| Blank: | Players prevented from using the option. |
| X: | Players can set this option if desired. |

NOTE: The joining player can only view what the host is setting in the Multiplayer Options screen. Joiners must visit the Options Game, Crew or 3D pages to set any allowable options.



The host can control the following options from the Multiplayer Options screen.

Fire Control Quick Launch: When enabled the time required to load weapons is reduced. For more information see *Main Menu/Options* on p. 24.

■ When the host is not controlling this option it can be enabled on the Options>Game page.

Show Truth: When enabled players view the actual identity and location of all platforms on the map during gameplay. For more information on this options see *Main Menu/Options/Game/Show Truth* on p. 29.)

■ When the host is not controlling this option it can be enabled on the Options>Game page.

Use Fire Control Auto Crew: When enabled the Fire Control Auto Crewman sets presets for torpedoes and antiship missiles. For more information see *Ship Stations/Auto Crewmen/Fire Control Auto Crewman* on p. 147.

■ When the host is not controlling this option it can be enabled on the Options>Crew page.

Use Sonar Auto Crew: When Enabled the Sonar Auto Crewman marks and classifies contacts in the Narrowband and Broadband Sonar Station. For more information see *Ship Stations/Auto Crewmen/Sonar Auto Crewman* on p. 146.

■ When the host is not controlling this option it can be enabled on the Options>Crew page.

Use TMA Auto Crew: When enabled the TMA Auto Crewman develops firing solutions in TMA for all contacts. For more information see *Ship Stations/Auto Crewmen/TMA Auto Crewman* on p. 147.

■ When the host is not controlling this option it can be enabled on the Options>Crew page.

Use Radar Auto Crew: When enabled the Radar Auto Crew marks all radar contacts as long as the Radar is on. For more information see *Ship Stations/Auto Crewmen/Radar Auto Crewman* on p. 147.

■ When the host is not controlling this option it can be enabled on the Options>Crew page.

Disable 3D: When enabled the 3D view is entirely disabled during gameplay.

■ When the host is not controlling this option it can be enabled on the Options>3D page.

Show Dead Platforms: When enabled platforms that are 100% destroyed appear on the Nav map whether you have detected them or not and whether destroyed by you or by some other platform. For more information see *Main Menu /Options/Game/Show Dead Platforms* on p. 29.

- When the host is not controlling this option it can be enabled on the Options>Game page.

Show Link Data: When enabled all friendly contacts are visible on the Nav map. For information see *Main Menu/Option/Game/Show Link Data* on p. 29.

- When the host is not controlling this option it can be enabled on the Options>Game page.

MULTIPLAYER DEFAULT SETTINGS

The host can set default options if he so chooses. Joining players can not set Multiplayer defaults.

To set Novice Settings:

Click **DEFAULTS (NOVICE)**. By default no Controlled by Host options are selected.

- To see suggested defaults, click in every Controlled by Host option in the first column.

The suggested settings appear in the Second column.

To set Advanced Defaults:

- Click **DEFAULTS (ADVANCED)**. The host controls all options and the only option enabled in the Settings column is Disable 3D. This ensures that no player in the game can use 3D or any other Game page or Crew options.

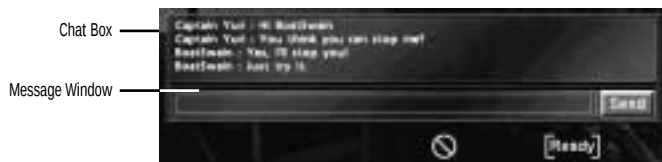
Sub Command Tip: If you are joining a game, make sure that you visit the Options>Multiplayer page to see which options your host has allowed.

CHAT

The Chat feature is available in the Game Room and during gameplay.

To chat in the Game Room:

1. Type a message in the Chat Box at the bottom of the screen then press **[ENTER]** or click **SEND**.
2. Messages appear in the Message window above the Chat Box.



In-Game Chat:

1. Press **[T]** to compose a message to be sent only to members of your team.
2. Press **[A]** to compose a message to be sent to all players in the game.
3. Press **[ENTER]** to send your message.
4. All in-game chat messages appear in the Multiplayer Chat History window. Click the yellow triangle History Selection Button to display the Multiplayer Chat messages.

NOTE: The yellow triangle flashes in the Task Bar to notify you that you have a chat message if you are viewing a different history.



MULTIPLAYER WARNING AND ERROR MESSAGES

It is possible for experienced players to customize *Sub Command*'s database, doctrine, and scenario files. Since it is imperative all players in a multiplayer game share the same version of certain files, you may occasionally receive warning and error messages. These messages inform all players specific files differ from the host's file. Anyone running a different version of *Sub Command* is informed their version does not match that of the host. Listed below are the messages most likely to occur, an explanation of why the message was received, and a suggestion for remedying the situation.

MESSAGE: "Error--This client has different databases than the host."

EXPLANATION: This error appears when one or more of the client's database files are different from the same files on the host's computer. The client player whose files differ from the host's files receives the above error in a message box. All other players receive the text as a chat message.

REMEDY: The client should copy the database files from the host player. The database files are located in the Database directory where *Sub Command* was installed. The client may want to make a copy of his original files before replacing them with the host's files.

MESSAGE: "Warning--This client has different doctrine files than the host."

EXPLANATION: This warning alerts all players the doctrine files of the host and the named client are different. The client whose files differ receives the above warning in a message box. All other players receive the text as a chat message. The message alerts players that either the host or the named client may have an unfair advantage over those players who have not modified their doctrine. This message does not prevent the named client from joining the game.

REMEDY: The client should copy the host's doctrine files. The doctrine files are located in the Doctrines directory where *Sub Command* was installed. The client may want to make a copy of his original files before replacing them with the host's files.

MESSAGE: "Error--Requested scenario has been modified or is different."

EXPLANATION: This message appears on the client's screen when the host selects a mission and the client's scenario file for the selected game is different than the same file on the host's computer. A chat message is also sent to all connected players to inform them of this discrepancy. This message will only appear if the client's *Sub Command* is running the same language as the host and the scenario is different.

REMEDY: The client should copy the host's scenario file.

MESSAGE: "This client is running a different language version than the host."

EXPLANATION: This message appears on the client's lobby screen when selecting a host. This is an informational message and may explain scenario difference messages later.

REMEDY: N/A

MESSAGE: "Warning--Requested scenario is different possibly due to language differences between client and host."

EXPLANATION: This message appears on the client's screen when the host selects a mission and the client's scenario file for the selected game is different than the same file on the host's computer. A chat message is also sent to all connected players to inform them of this discrepancy. This message will only appear if the client's *Sub Command* is running a different language than the host and the scenario is different.

REMEDY: The client can copy the host's scenario file or the game can be continued as normal. The host can decide whether this is a trusted client using a different language scenario file.

MISSION EDITOR

The Mission Editor allows you to create single, and multiplayer missions anywhere in the world! Platforms for sixteen countries as well as civilian objects are available for placement in your scenarios. In the Mission Editor you can create scenarios that place a player in command of a Seawolf, an Improved Akula or Akula II, or a 688(I) Improved Los Angeles class submarine.

By using the Probability of Inclusion, Random Start Boxes, and Dynamic Groups features you can randomize your missions so they play differently each time!

This section creates these subsections:

Getting Started: Covers creating a new region, loading an existing region and importing a 688(I) Hunter/Killer or Jane's Fleet Command mission to convert it for use in *Sub Command*.

Mission Creation: A brief overview of the interface and issues involved in creating missions.

Mission Map: The Mission map, its readouts, menu and tools.

Mission Object Menu: The options available from an object's right-click menu.

Object Buttons: Adding a sub, ship, global goal, and building objects to a mission.

Editor Menu: Editor menu options and their use.

Scenario Browser: The Scenario Browser and its use.

Object Properties Panel: Available object types are listed alphabetically and their Object Properties Panel pages are explained

Goals: Types of goals and their uses, Goal Precedence and Goal Object Properties Panel Pages.

Dynamic Groups: The use of Dynamic Groups to make scenarios play differently each time they are played.

Mission Editor Hot Keys: Hot keys available in Mission Editor.

Starting a Created Mission: Step-by-step instructions for saving and starting a created mission.

GETTING STARTED

Click **MISSION EDITOR** in the Main menu to display the Mission Editor Region Selection interface. From here you can select a region for a new mission or load an existing mission to edit or view.



Mission Map

NOTE: Whenever the term 'click' is used in this manual, it refers to a single left mouse click. A right mouse click is designated as a 'right-click.'

CREATING A NEW MISSION

To create a new mission you must first select a region on the world map as the mission's location. A region is a 600 by 600 nautical mile square centered on a specific longitude and latitude designated by the Choose Region cursor.

To select a region:

1. Place the cursor in the Mission map. The Choose Region cursor appears on the map as a box. The box changes shape depending on its latitude location on the map.
2. Use the arrow keys to scroll the map left/right until the desired map location is visible.
3. Zoom the map by pressing  and  or **CONTROL** + left/right mouse click. Use the arrow keys to pan the map.
4. Center the Choose Region cursor over the desired location of your new scenario. Right-click that region to select it as the mission area.
5. You are prompted to confirm your region choice. Click **OK** to accept the selected region or click **CANCEL** to return to the Region Selection map and select a different location.

The chosen region is loaded, and the Mission Creation screen appears.

EDITING AN EXISTING MISSION

From the Mission Editor's Region Selection interface you can also load and edit a mission previously created by you or another user.

To select an existing scenario to edit:

1. From the Editor menu at the top of the screen select Mission>Load Mission.
2. The Open File Dialog box appears. Scroll to the desired scenario file name.
3. File extensions in use are as follows:
 - .mu User created mission
 - .mup Password protected user mission. The mission can be played but not edited unless the user supplies the proper password in Mission Editor.
4. Click on the file name then click **OK** or double-click the filename to open that file in the Mission Editor.

NOTE: To view or edit scenarios created by your friends, copy the desired scenario file into the Scenario directory in the directory where the game is installed. The scenario can then be selected from the Load Mission menu option.

IMPORTING SCENARIOS

You can import your favorite *688(I) Hunter/Killer* and *Jane's Fleet Command* scenarios for use in *Sub Command*. The ship databases differ between these three games therefore some platforms in the imported scenarios may not be available in the current game. Imported scenarios will need varying degrees of editing to work properly in *Sub Command*.

To Import a 688(I) Hunter/Killer or Jane's Fleet Command scenario:

1. Copy the desired file into the *Sub Command* Scenario directory in the location where the game is installed.

2. From the Editor menu at the top of the screen select Mission>Import.
3. The Open File Dialog box opens. Select the desired file to be imported and click **OK** or double-click the file.
4. You are prompted to select a database map. (688(I) Hunter/Killer or Jane's Fleet Command)
Select the appropriate mapping for the game file you are importing.
5. When the file opens look for red object labels (ships names, aircraft names, etc) on the map. Red text indicates that the object needs to be remapped for *Sub Command* because the object is different or missing in the current database.
6. Select the icon of an object with a red label and change the object class in the Object Properties Panel to one that is available in *Sub Command*. Continue until all missing objects are remapped. Then save the mission using the Mission>Save menu. For information on setting object properties See *Mission Editor/Object Properties Panel* on p. 178.

NOTE: The Object Names option must be turned ON in the Mission Map menu or the View menu for the Object labels to appear on the screen. Object names are ON by default.

MISSION CREATION

Selecting and loading a region on the Region screen or loading an existing mission activates the Mission Creation screen. The region you selected in the Region Screen replaces the world map and all Editor menu functionality is available. You can now tailor a mission that is as simple or as complicated as you desire.

The Editor menu options provide the means to add battlegroups, set alliances, add and define goals, set environmental conditions and further customize your mission in a variety of ways. The remainder of this chapter describes how to add and customize objects and explains the functionality of all Editor menus.

New objects are placed on the Mission map using the object buttons along the lower right. Clicking on any object's map icon allows you to edit its properties in the Object Properties Panel.

The Scenario Browser appears over the Object Properties Panel when no object is selected on the Mission map. The browser is very useful for tracking all objects, goals, and groups in the scenario. You can also quickly view the Object Properties Panel pages for any object, goal or group by clicking on its Scenario Browser text. Press **[ESC]** or click the map to bring up the Scenario Browser. The Mission Creation screen of the Mission Editor is shown below with a regional map replacing the world map in the map area.

NOTE: You must place at least one controllable submarine in your mission. Controllable submarine classes are the United States Seawolf class, the United States Los Angeles class (688(I)), and the Russian Akula-I Improved and Akula II classes. After you add one of these subs, you must designate it as controllable on page two of its Object Properties Panel. See *Object Buttons/Add Submarine or Ship* on p. 166 and *Object Properties Panel/Submarine Properties* on p. 185.



MISSION MAP

The Mission map contains the 600 by 600 nautical mile square region that was designated in the Mission Creation screen. It is on this map that you create the mission by placing all objects and assign goals, tactics, and define formations for the scenario.

NOTE: The words map and chart are used interchangeably in this section of the manual.

MAP READOUTS

- Latitude and longitude values display in the lower left and change with the cursor position.
- The depth and elevation readout, also in the lower left, shows depth in feet when the cursor is over water and altitude in feet when the cursor is over land.
- When the cursor is over the extreme northern and southern latitudes the amount of ice coverage in that area of the ocean is displayed as a percent just below the depth and elevation indicator. Ice itself is not visible on the map. The level of ice coverage changes depending on the time of year you set in the Editor menu's Edit>Environmental Conditions dialog box.
- A range scale is located in the lower left corner of the display to aid in determining distances.
- To determine the distance and bearing from a point on the map to another point, click the first point and drag the cursor to the second point. A readout of the bearing in degrees and the distance in nautical miles is displayed in lieu of the range scale in the lower left corner of the map. Release the mouse button to remove the range circle from the map.
- Press **[SHIFT] + [X]** to toggle the display of the Longitude/Latitude, the Height/Depth and the Ice coverage readout.
- Press **[SHIFT] + [Z]** to toggle the display of the range scale.

NOTE: Use of the water depth readout information is important when placing submarines, since the water depth may be too shallow for them to operate.

MAP CONTROLS:

It is necessary to zoom in when placing objects that must be close together.

- Press **=** or **CONTROL** + left-click to zoom in.
- Press **-** or **CONTROL** + right-click to zoom out.
- Use the arrow keys to pan the map.

MISSION MAP MENU

Right-clicking on the Mission map brings up the Mission Map menu. From here several map display options are available. A checkmark in front of any of the first four options indicates that the option is ON.

Bathymetry: When ON the Mission map displays detailed colored shading indicating variations in water depth and land elevations. When OFF the detailed shading is replaced by solid blue for water and solid yellow for land. (Defaults to ON.)

Scale: When ON the range scale displays in the lower left corner of the Mission map. (Defaults to ON.)

Object Name: When ON object names display on the Mission map. This menu feature can help reduce clutter on the Mission map when creating a mission. (Defaults to ON.)

Tactics: When ON all object tactics display as white lines on the Mission map. The primary purpose for hiding the display of tactics is to reduce clutter when building a mission (Defaults to ON.)

Use Small Icons: When ON small object icons are displayed on the Mission map. When your scenario has numerous options the use of smaller icons helps reduce the clutter. (Defaults to large icons.)

Chart Text Label: When this option is selected the Map cursor changes to a + and you are prompted in the Description Bar to click the map to place a label. A text label appears on the clicked location as a small red square followed by the word Label and a sequentially higher number with each label placed. By default the square and the text are red. The text and the color can be changed.

1. Click the small red square to bring up the Text Label properties panel on the right of the screen.
2. Set the text content in the Label edit box.
3. Select the desired color in the **Text Color** drop-down list.
4. Click in the square to drag the label to a new location.

NOTE: Text labels placed here appear as map text when the scenario is played.

Draw Chart Lines: When this option is selected the Map cursor changes to a +.

1. Click the map to place a line's starting point.
2. Click the desired point to draw the line to that location.
3. Click additional point to place a line to that point from the previous one.
4. Press **[ESC]** to complete the process.
5. To delete a line, click it to select it and press **[DELETE]**. Each line must be deleted separately. A selected line is yellow instead of white.

OBJECT BUTTONS

Use the Object Buttons on the bar located at the bottom right of the screen to place submarines, ships, global goals, and land objects on the Mission map. To customize an object you must select it and set specific properties in its Object Properties Panel pages at the right of the screen. See *Mission Editor/Object Properties Panel* on p. 178.

- Click the object's icon or select its name in the Scenario Browser to select it and display its Object Properties Panel pages.



Sub Command Tip: Be aware of the great distances covered on the Mission map when creating a mission. You can check how long it will take a ship to traverse a given distance by clicking on the waypoints of certain tactics. The Object Properties Panel to the right of the screen displays the amount of real time it takes the platform to reach that point. Though single player games have the option of time compression multiplayer scenarios cannot use accelerated play. You may want to zoom in when placing objects to ensure the desired distance between objects.

ADD SUBMARINE OR SHIP

- Click the submarine or ship buttons to add an object of that type.
 - Move the cursor to the map and click to place the object. Customize the object using the property options available in the Object Properties Panel to the right of the map.
- To learn more about the properties available for submarines or ships, see *Mission Editor/Object Properties Panel/Submarine or Ship Properties*, on p. 166.

ADD GLOBAL GOAL

- Click the Goal object button then click the map to place the goal icon.
 - Click the goal icon to select it and display its Object Properties Panel pages.
- For more details see *Mission Editor/Goals/Goal Object Properties Panel Pages* on p. 191. To arrange their order of importance, see *Mission Editor/Goals/Goal Precedence*, on p. 194.

ADD BUILDING

- Click the building object button.
 - Move the cursor within the Mission map and click to place the building. Click the building object icon to display its Object Properties Panel pages.
- For details on assigning building properties, see *Mission Editor/Object Properties Panel/Building Properties* on p. 182.

NOTE: Use of the land altitude readout information is important when placing buildings, since the buildings need to be placed on land. You may want to make use of the terrain features when positioning your building.

MISSION OBJECT MENU

Right-clicking on a mission object's icon enables the Mission Object menu. Some of the features found in the Mission Object menu are also available from the Object Properties Panel pages for the selected object.

Mission Object menu items that are not available for a specific object are grayed out and disabled. For example, since a submarine does not have embarked aircraft, all options relating to aircraft are unavailable.

The Mission Object menu provides a shortcut to add or delete platforms from formations, and assign attached goals to the selected object.

- The Add Inflight Aircraft and Add Air Station options are only available for ships with embarked aircraft and land-based airport objects once aircraft have been added to the airport.
- The Add Air Corridor menu item only applies to land-based airports.
- The Flight Schedule menu item is only available on the Mission Object menu. Use the Flight Schedule menu item to assign alert readiness conditions to aircraft embarked on a ship or for aircraft located at an airport.

ADD TO FORMATION

Mission Object menu's Add to Formation item is only available if there is a formation in the mission you are creating. To add a platform to an existing formation, this menu option is the quickest method.

To add an object to a formation:

1. Right-click the platform object to display the Mission Object menu.
2. Select Add to Formation. A menu appears displaying the names of formations to which you can add the object. Once the object is added to the formation, a blue line links this object to the formation leader on the Mission map.

NOTE: Once you add the platform to a formation, any tactics you may have previously assigned to this platform are lost. Platforms in formation follow the formation leader and its assigned tactic.

UNLINK FROM FORMATION

Use the Unlink from Formation option from the Mission Object menu to remove a platform object from a formation.

To use this feature:

1. Right-click the platform icon to access the Mission Object menu.
2. Select Unlink From Formation. The Mission map no longer shows a blue link line attaching the object to the formation leader.
3. On page one of the selected object's Object Properties Panel, assign a new tactic to the object.

ADD ATTACHED GOAL

Goals can be attached to specific objects in a mission.

To add an attached goal:

1. Right-click the object's icon to activate the Mission Object menu.
 2. Select Add Attached Goal. You are prompted in the Description Bar to click the Mission map to position the attached goal. A blue link line between the attached goal and the object is established.
 3. Click the goal icon to select it and display its Object Properties Panel pages.
- For a detailed discussion on the types of attached goals and how to customize attached goals, see *Mission Editor/Goals/Attached Goals* on p. 190.

ADD INFLIGHT AIRCRAFT

The Add Inflight Aircraft menu option is only available if the object you have selected has embarked aircraft or is a land-based airport with aircraft already assigned. For information on assigning aircraft to an airport see *Mission Editor/Object Properties Panel/Airport Properties* on p. 180.)

To add an inflight aircraft:

1. Right-click the aircraft's base object icon (ship or airport) to display the Mission Object menu.
2. Select Add Inflight Aircraft. In the Description Bar below the Mission map you are prompted to left-click the map to position the inflight aircraft. The inflight aircraft icon is placed on the Mission map and a blue link line appears between the aircraft and its base.
3. Click the inflight aircraft icon to select it. The Object Properties Panel has a Name field with a selection of available aircraft to use for this station. The Object Properties Panel also has fields allowing you to specify the speed, altitude, tactic and assign the weapons loadout for the aircraft. For additional details on inflight aircraft, see *Object Properties Panel, Inflight Aircraft Properties* p. 183.

ADD AIR STATION

The Add Air Station menu item from the Mission Object menu is only available to ships with embarked aircraft or an airport after aircraft have been added. The primary difference between adding an inflight aircraft and an air station is that the inflight aircraft option allows a single aircraft to be placed while the air station can be assigned up to two aircraft.

To add an air station:

1. Select the object that has aircraft assigned and right-click the selected icon to invoke the Mission Object menu. Select Add Air Station.
 2. Click the Mission map to place the air station.
 3. Click the air station icon to select it. Options for this air station appear in the Object Properties Panel. The panel has two fields that allow you to specify what aircraft you want assigned to this station.
- For complete instructions on setting air station properties see *Mission Editor/Object Properties Panels/Air Station Properties* on p. 179.

ADD AIR CORRIDOR (AIRPORT)

The Mission Object menu's Add Air Corridor menu is only available for land-based airport objects. This feature allows you to add an air corridor attached to an airport. This option is different from the Editor menu's Add>Add Air Corridor option which adds independent flight paths that traverse the mission area. The Add Air Corridor feature is also available on the third page of the Object Properties Panel options for an airport.

To add an air corridor:

1. Right-click an airport's object icon to activate the Mission Object menu and select Add Air Corridor.
2. Click in the direction that you want the corridor to run. One end of the air corridor is anchored to the airport and the other end automatically extends to the edge of the Mission map in the direction you click.
3. To select an air corridor that is attached to an airport, you must click the large white rectangles appearing at the edge the corridor's path at the edge of the map. You may have to zoom the map all the way out until the entire region is visible before you can access the corridor's selection point. When the corridor is selected the white lines turn red. For details on customizing an air corridor, see *Mission Editor/Object Properties Panel/Air Corridor Properties*, on p. 179.

FLIGHT SCHEDULE

In *Sub Command* you can set the state of readiness for enemy and allied aircraft embarked on ships and at airports. Aircraft are controlled by the AI but what you set here determines how quickly ASW planes and helicopters respond to submarines detected by AI controlled ships. The default readiness state for all aircraft is thirty minutes. You have the option to schedule some aircraft in either an Alert 5 condition (aircraft is available to launch in five minutes), Alert 15 (aircraft is available to launch in fifteen minutes), or Alert 30 (aircraft is available to launch in thirty minutes). For some ships with embarked aircraft there is only one runway or landing pad available. Therefore only one aircraft is allowed to be in an Alert 5 readiness state. Aircraft carriers have multiple airstrips from which to launch aircraft so they permit more than one aircraft to be in Alert 5 condition. You are not able to place more than the allowed number of aircraft in an Alert 5 condition. You may place up to 24 aircraft in Alert 15 and Alert 30 condition.

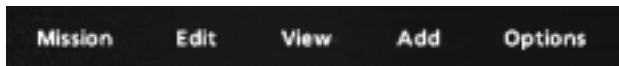
To access the Flight Schedule:

1. Right-click the object icon for an airport or ship with embarked aircraft to display the Mission Object menu.
2. Select **FLIGHT SCHEDULE** to display the Flight Schedule dialog box.
3. Select the radio buttons for the desired alert condition (5, 15, or 30) for each individual aircraft.
4. Change the Flight Schedule for other aircraft types by selecting them in the list box at the top of the Flight Schedule box.

NOTE: The Flight Schedule menu item is only available if a ship or airport has aircraft assigned to it.

EDITOR MENU

The menu bar at the top of the Mission Creation screen contains tools for editing, saving, and further customizing your mission. The Editor menu consists of the following menu items: Mission, Edit, View, Add and Options.



MISSION MENU

New Mission: Create a new mission by selecting a new region. You are prompted to save the current mission then returned to the Region Selection Screen.

Load Mission: Load a previously created mission.

Save Mission: Save your current mission. If your current mission is a new mission and has not yet been saved, you are prompted for a file name.

Save Mission As: Specify a new name for your current mission and save it.

Import: Import a 688(I) *Hunter/Killer* or *Jane's Fleet Command* scenario. Place the scenario you want to import in the Scenario directory in the directory where *Sub Command* is installed. See *Mission Editor/Getting Started/Importing Scenarios* on p. 162.

Set File Password: Selecting this option displays the Password for Scenario File dialog box. Type the desired password in the Password and Password Verification fields and click **OK**. The file cannot be loaded unless the password is supplied.

Recent Files: Displays the four most recently opened files.

Exit: Exit to the Main menu screen.

EDIT MENU

Copy: Copy a hooked object on the Mission map. (You may also press **CONTROL** + **C**.)

Paste: Paste a copied object anywhere on the map. (You may also press **CONTROL** + **V** and click the map to paste the object.)

Delete: Delete a selected object. (You may also press **y**.)

Select Multiple Objects: Allows you to click and drag over the map to select more than one object to edit. As you drag the mouse, a box appears showing the selection area. Any objects appearing in this area are selected. Release the mouse button to complete selection of the objects.

Set Random Start Box: Allows you to set a Random Start Box around a selected object. When this option is selected, a box with the selected object at the center appears. This box moves and sizes as you move the mouse. Click the left mouse button to set the box size. The centered object begins the mission at a random point within this square. Once set, a Random Start Box displays with green lines. Tactic boxes have white lines.

Remove Random Start Box: Deletes the Random Start Box assigned to the selected object.

Side Alliances

Selecting this option displays the Alliance Manager Dialog. From here you select the sides to be allied. Setting up side alliances is useful in scenarios that require two countries working in cooperation. Assume you want to have the U.S. and Taiwan working together in a mission. In the Alliance Dialog set side 0 (U.S.) to be allied with Side 1 (Taiwan). If during gameplay you opt to

Show Link Data you see the actual position and type of the Taiwanese platforms as blue (friendly) symbols on the Nav map. The Taiwanese platforms are controlled by AI but do not attack your platforms. You can also set two AI controlled sides to be allies. They do not attack each other. They only attack sides not in their alliance.

Alliance Name: Existing named alliances display in this drop-down list. To add a named alliance, click **ADD ALLIANCE**.

Add Alliance: Clicking on this button brings up the Alliance Name dialog box. Type the desired name in the dialog box.

NOTE: You can not type an Alliance Name in the Alliance Name drop-down list. You must use the Add Alliance button and add a name in the Alliance Name dialog box to add names to the list.

Delete Alliance: Deletes the Alliance selected in the Alliance Name Drop-down list.

Sides In Alliance: Displays the sided in the Alliance selected in the Alliance Name drop-down list.

Available Sides: List all sides possible, even those that have not been assigned any platforms.

To Create an Alliance:

1. In the Alliance Manager Dialog box click **ADD ALLIANCE**. The Add Alliance dialog box appears.
2. In the Add Alliance dialog box, type a name for your alliance in the Alliance Name edit box. Click **OK** to return to the Alliance Manager Dialog box.
3. In the **Alliance Name** drop-down list, select the name of the alliance you just created.
4. In the **Available Sides** list select the name of a side you want to place in the alliance then click the * arrow to place that side in the Sides in Alliance list (left box). Add sides from the Available Sides list until the Sides in Alliance list contains the desired members.
5. Select a name in the **Sides in Alliance** list on the left and click the  to return remove a side from the selected alliance.
6. Click **OK**.



Rules of Engagement

Selecting this option displays the Rules of Engagement (ROE) dialog box. Defaults to Wartime ROE.

1. Select a side in the Sides Available list.

2. Click one of the following options to assign the Rules of Engagement for all platforms on that side.

War Time: Platforms fire upon all threat platforms

Peace Time: Platforms do not fire unless fired upon.

Environmental Conditions: Allows you to set the environmental conditions for your mission.

Selecting this option displays the Conditions dialog box. Options in the Conditions dialog box are explained below.

Sea State: Set the condition of the sea, from 1 (calm) to 5 (choppy).

Time of Day: Set the time of day at which the mission begins using 24-hour military time.

NOTE: When you make a change to the time of day, a confirm box appears stating "Changing Time of Day will affect all goals and aircraft with a launch time. Do you want the dates to be automatically updated to the new start time?" If you select the YES button, all times for your goals and aircraft launches are adjusted to maintain the same time interval relative to the original mission start time.

Bottom Type: Set the state of the sea floor: rock, mud, or sand. These conditions can affect sound propagation for active and passive sonar operations.

Month: Set the month in which the mission takes place. The time of year designated determines the level of ice coverage in the northern and southern latitudes and the amount of daylight in a mission.

Weather: Set the weather conditions in which the mission takes place. Available selections are Clear, Puffy Clouds, Overcast and Rain. These weather conditions can affect sensor detection ranges and visual ranges.

SSP Type: (Sound Speed Profile). The selections for SSP types are Surface Duct, Bottom Limited, and Convergence Zone. These SSP types determine the sound propagation paths available for acoustic sound energy to travel. Bottom Limited has the shortest ranges and Convergence Zone the longest ranges.

Cloud Height: Set the height of cloud cover (no lower than 1000 meters).

VIEW MENU

Bathymetry: Toggle the display of sea/land contour shading **ON/OFF**. A check mark indicates this feature is **ON**. (Defaults to **ON**.)

Scale: Toggle the map scale indicator **ON/OFF**. A check mark indicates this feature is **ON**. (Defaults to **ON**.)

Object Names: Toggle the display of names adjacent to objects **ON/OFF**. A check mark indicates this feature is **ON**. (Defaults to **ON**.)

Tactics: Toggle the display of all assigned tactics and waypoints **ON/OFF**. A check mark indicates this feature is **ON**. (Defaults to **ON**.)

Gridlines: Toggle the display of gridlines on the map. (Defaults to **OFF**.)

Type: Toggle **ON/OFF** the display of the various types of platforms and objects: surface ships, aircraft, submarines, land-based objects, mines, and goals. A check mark indicates that the icons for a specific type are displayed on the Mission map. (All types default to **ON**.)

Side: Choose which sides' forces are shown on the map. A check mark indicates that icons for the specified side are displayed on the Mission map. (All sides default to **ON**.)

Group: Toggle the display of all platforms in a dynamic group ON/OFF. A check mark indicates that the platforms in the group are displayed on the Mission map. (Each group defaults to **ON**.)

Filters: Allows you to choose several view filters at once, including viewing by side, platform type, and dynamic group. A check mark indicates that the particular side, type or group is ON and is displayed on the Mission map. (All are **ON**.)

View Full Screen 3D: Selecting this option displays in full screen the 3D object in use for the selected platform or building.

- Click the 3D model and drag the mouse to rotate the angle of your view
- Press **[CONTROL]** and left-click and drag to zoom in and out.
- Press **[CONTROL]** + left-click and drag left or right to pan.
- Press **[CONTROL]** + arrow keys to rotate around the object.
- Press **[ESC]** to return to the Mission Editor interface.

Sub Command Tip: Check the 3D view for airports and buildings. If the building appears to be buried, adjust the placement of the building icon.

ADD MENU

Transiting Waypoints: Assign a set of moveable waypoints for a platform to transit before beginning a specified tactic.

NOTE: The Transiting Waypoint menu item is only available when you select a platform that has been assigned a name and a tactic. The platform starts the mission at the outermost waypoint and transits each waypoint until it reaches the location of the platform icon. The platform then executes its assigned tactic.

Waypoint: Add an additional waypoint to the platform's path for tactics that already contain waypoints.

NOTE: When you add a waypoint to a tactic you must have one of the waypoints in the tactic or the object icon itself selected to activate the menu item.

Minefield: Place a minefield on the map. Mines must be placed in water.

To add a minefield to your mission:

1. Select Minefield from the Editor menu's Add menu
2. You are prompted in the Description Bar to click and drag on the Mission map to define the area for the minefield.
3. When you have defined the area on the map, release the mouse button. You have defined the area in which the mines are evenly distributed. The Minefield Designation dialog box appears.

The Minefield Designation dialog box fields are described below.

Mines Across: Enter the number of mine columns.

Mines Down: Enter the number of mine rows.

NOTE: The total number of mines permitted in the minefield is limited to one hundred. Check the total number of mines by multiplying the number of rows by the number of columns.

Mine Type: Select the mine type from the drop-down list, either a Moored Contact or Moored Influence Mine. A contact mine detonates only when an object makes physical contact. An influence mine detonates when a ship or submarine disturbs the area around the mine. (A Moored mine anchored with a mooring cable.)

Depth (ft): Enter the depth for the minefield in feet in this field. If you enter a mine depth that exceeds the water depth, a message box appears when the mission is saved notifying you that the object exceeds the water depth.

Side: Select the side this minefield belongs to.

NOTE: Use of the water depth readout information is important when placing mines since the water depth may be too shallow for them to operate.

Add Chart Text Label: When this option is selected the Map Cursor changes to a + and you are prompted in the Description Bar to click the map to place a label. A text label appears on the clicked location as a small red square followed by the word Label and a sequentially higher number with each label placed. By default the square and the text are red. The text and the color can be changed.

1. Click the small square to bring up the Text Label properties panel on the right of the screen.
2. Set the text content in the Label edit box.
3. Select the desired color in the **Text Color** drop-down.
4. Click in the square to drag the label to a new location.

NOTE: Text labels placed here appear as map text when the scenario is played.

Add Chart Lines: When this option is selected the Map Cursor changes to a + and you are prompted in the Description Bar to click the map to add lines.

1. Click the map to place a line's starting point.
2. Click the desired point to draw the line to that location.
3. Click additional point to place a line to that point from the previous one.
4. Press **[ESC]** to complete the process.
5. To delete a line, click it to select it and press **[DELETE]**. Each line must be deleted separately. A selected line is yellow.

OPTIONS MENU

Set Player Side: Choose the side the player commands.

Create Dynamic Group: Create a grouping of objects and assign a probability of inclusion for the group as well as specific members of that group. A group can contain any combination of ships, planes, subs, or land-based objects. See *Mission Editor/Dynamic Groups/Create Dynamic Group*, on p. 195.

Edit Dynamic Group: Modify dynamic group properties. You can change the composition of a dynamic group, and adjust the probability that individual ships within that group appear. See *Mission Editor/Dynamic Groups/Edit Dynamic Group* on p. 196.

Goal Precedence: Set the order in which goals must be accomplished to complete the mission. For detailed information see *Mission Editor/Goals/Goal Precedence*, on p. 194.

Define Mission Description: Create or edit a description of the mission. This is a brief description of the mission that appears on the Mission Selection screen.

Set Mission Title: Create or edit a name for the mission and define its level of difficulty. Level of Difficulty is represented by the number of stars that appear on the Mission Selection screen in front of the mission title. One star indicates an easy mission. Defaults to one star. If no mission name is specified, it defaults to the mission's file name.

NOTE: The mission title text field is limited to twenty characters.

Formations: Choose a formation and type of group, or customize a formation. Formations are composed of multiple ships. To place a formation, follow the steps for placing a single ship. See Mission Editor/Object Buttons/Submarine or Ship on p. 166. The formation options are described below.

Create Formation: Allows for the creation of a custom formation.

To create a custom formation:

1. Place all objects to be included in the formation using the Object Buttons. Select all the objects by using the Edit>Select Multiple Objects option then dragging a box around the platforms you wish to select or press q while clicking on multiple objects.
2. From the Formations menu select Create Formation. The Formations dialog box appears. Enter a name in the Formation Name field. Select the formation leader from the list of selected objects. The objects added to this formation follow the speed and movement of the leader. Ships in a formation are connected on the map by blue lines.
3. To add a single object to the formation, place the object icon on the map, then right-click it. From the Mission Object menu select Add to Formation. A list of available formations appears. Choose the formation to which you would like to add the platform.

Delete Formation: All formations are listed when this option is selected. In the list select the name of the formation you want to delete. The lines between ships in the formation are removed. You must now assigned a tactic to the ships.

Standard Formation: Allows for the placement of one of several standard battlegroup formations on the Mission map. Select the type of battle group you wish to place on the map. Right-click the map to place the group.

SAG Place a Surface Action Group as your formation.

ARG Place an Amphibious Ready Group as your formation.

CVBG Place a Carrier Battle Group as your formation.

NOTE: When you place a fleet on the map, it defaults to a United States battlegroup. To change the fleet's nationality, you must click each individual ship and assign it a new nationality, class and name using the Object Properties Panel at the right of the map. See *Mission Editor/Object Properties Panel*, on p. 178.

Formation Tactics:

The tactics available for the leader of a formation are different from those of a single ship. To view the tactics available to a formation leader, select the formation leader and view the options listed in the Tactics drop down list in the Object Properties Panel.

PIM Waypoints: Drag a line across the map and release. The formation leader travels through the waypoints and continues in a straight line upon reaching the final waypoint.

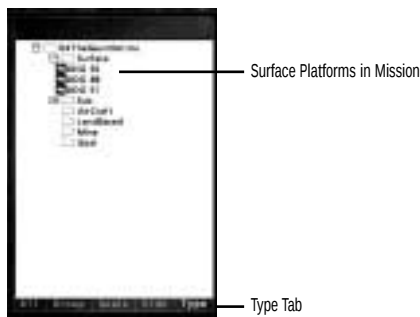
PIM Area Waypoints: Drag a square across the map and release. The formation leader travels to each waypoint and begins again when the last waypoint is reached.

Sub Command Tip: To rearrange the ships of your formation, click and drag the individual objects to the desired place on the map.

SCENARIO BROWSER

The Scenario Browser is a useful tool for locating a specific platform, goal or group in a scenario you are creating or editing. It is also valuable for reviewing and filtering objects in a large or complicated scenario.

The Scenario Browser displays over the Object Properties Panel when no object is selected. The top folder on every tab contains the scenario filename once the scenario is saved. Until the scenario is saved the default text *Unnamed Scenario* appears after the yellow directory at the top of all browser pages.



USING THE SCENARIO BROWSER

The names of objects are contained in folders on each tab.

- Click the – in front of a yellow folder to hide the names of all object names in that folder.
- Click the + in front of a folder open the folder and display the names of the objects contained in the folder without selecting anything in the folder.
- Click a folder name to select the folder.
- Click an object name to select that object.
- If the object's Type, Group or Side is not hidden using the View filters the object's icon is highlighted on the map. Depending on your level of zoom, you may need to scroll or zoom in or out to see the highlighted icon.
- Selecting a specific object name on any tab page displays its Object Properties Panel pages. You are returned to the page you were on the last time that object was selected.
- Use selections in combination to further filter what is on the map. For instance, select Side 2 on the Side tab and Surface on the Type tab to see only Side 2 surface ship icons on the map.

To return all object icons to the map:

- Click the filename text at the top of all pages to turn off all filters. Clicking on the filename on any tab deselects all options on that tab and turns off that specific filter.

or

- From the Editor menu select View>Filters and place a check in front of all unchecked selections, then click **OK**.

NOTE: If you have selected the filename at the top of the browser page and the icon you want to see on the map is still not visible, the object's icon is being hidden by a filter on a different tab.

To display the Scenario Browser when it is hidden, press E or click the map to deselect any selected objects. The browser is displayed when no object is selected on the map. The Scenario Browser's five tabs are described below.

ALL TAB

By default the All tab is visible when the mission is opened. As you add objects to the scenario all object names are listed on the All page in the order in which they are entered.

- Click the name of any object to display the object's Properties Panel pages and select its icon on the Mission map.

GROUP TAB

When dynamic groups are present in a scenario they are listed by name on the Group tab. The members of each group are listed in a group folder. For information about creating Dynamic Groups see *Mission Editor/Dynamic Groups* on p. 195.

- Click a group name to display that group's icons on the Mission map. When a group name is selected, its text is blue.
- Click the + in front of the folder to open it without selecting the group name.
- Clicking on a group name hides the icons of any other groups on the Mission map. Only the icons of the selected group members and those of objects that are not part of any dynamic group are visible.

To redisplay all groups on the map:

- Click the scenario filename at the very top of the browser's Group tab to redisplay all groups on the map.

To redisplay a specific group on the map:

- Select View>Group then the desired unchecked group name.
- Or select View>Filters then ensure that there is a check mark in front of the name of the dynamic group you want displayed.

GOALS TAB

- Click a goal name on the Goals tab to select that goal's icon on the map and brings up its Properties Panel pages.
- If the map is zoomed in, you may not be able to see the selected icon. Zoom out to determine its location.
- Goal icons that are attached to objects on a specific side, type or group are hidden on the map if that side, type or group is hidden. The goal's Properties Panel pages appear when the goal name is selected even if you can not see the icon on the map.

SIDE TAB

The Side tab allows you to view only the objects assigned to a specific side. Objects from all other sides are hidden.

- Click a side name to select that side and hide the object icons associated with all other sides on the map.
- Click the + in front of a side name to display the names of all objects on that side without selecting that side name.
- Click the text of the scenario filename at the top of the Side browser page to redisplay all sides in the scenario in the map.

TYPE TAB

Selecting the name of an object type on the Type tab displays only objects of that type on the map and hides the icons of all other types. Object types are surface, submarines, air, land-based (buildings), mines and goals.

- Click the + in front of a type name to display the names of all objects of that type without selecting that type name.
- Click a type name to select that type of object and hide the object icons of all other types on the map.
- the text of the scenario filename at the top of the Type browser page to redisplay all types of objects in the scenario on the map.

OBJECT PROPERTIES PANEL

Every object has properties that can be set in the Object Properties Panel.

Finding the desired Object Properties Panel: To see a specific object's Object Properties Panel pages, Click the desired object's icon, or select the name of the desired object in the Scenario Browser.

- Click the map or press **[ESC]** to bring up the Scenario Browser.

Navigating the pages: The current page number of the available pages is shown at the bottom of the Object Properties Panel

- Click the right facing arrow at the bottom of the panel to move to the next page.
- Click the left facing arrow at the bottom of the panel to move back a page.
- You return to that last page you were on when you select that object again.

Viewing 3D Models: The last page in the Object Properties Panels for a platform or building object displays the 3D model in use for that object. For platforms a Country, Class and Name must be selected on page one before any 3D model can be displayed on the 3D model page. Buildings must be assigned a specific name before a 3D model can appear.

When a 3D model is present on the last page of the Object Properties Panel it can be manipulated as described below.

- Click the 3D model and drag the mouse to rotate the angle of your view
- Press **[CONTROL]** and drag forward and back to zoom in and out. (You can also use the mouse wheel or press **[CONTROL]** + **[+]** or **[-]** to zoom in and out.)
- Press **[CONTROL]** and click and drag left or right to pan.
- Press **[CONTROL]** + arrow keys to rotate around the object.

Below in alphabetical order are the different types of objects that are available in *Sub Command*. A page by page description of the properties that can be set for each type of object follows the name of each object type.

NOTE: Goal Object Properties Panel pages are covered separately in Mission Editor/Goals/Goal Object Properties Panel Pages on p. 191.

AIR CORRIDOR PROPERTIES

Air corridors are added from an airport's Mission Object menu or with the Editor menu's Add>Add Air Corridor option. Click one of the end points to display these Object Properties Panel pages.

An Air Corridor is a flight path commercial aircraft take during the mission. Air corridors can be attached to airports or can be independent flight paths traversing the mission area. You can change air corridor options such as the type of aircraft and rate of generation in the Object Properties Panel.

NOTE: For an air corridor attached to an airport, click the endpoint at the edge of the map to select the air corridor and display its Property Panels. You must add aircraft to the air corridor even if there are aircraft added to the airport. Airport aircraft will not show up in the air corridor's Available Aircraft list.

PAGE ONE

Corridor Width: Set the width (in miles) of the air corridor.

Plane Generation per Hour: Set the rate planes to be generated. This is the number of planes per hour of the type set on page two.

Plane Direction: Toggle button to set the direction aircraft travel in the air corridor.

Minimum Altitude: Set the minimum altitude aircraft can fly in the air corridor.

Maximum Altitude: Set the maximum altitude aircraft can fly in the air corridor.

PAGE TWO

Available Aircraft: List of aircraft that are available to populate the air corridor. If nothing appears in the list, aircraft must be added using the Add Aircraft button below the list box.

Add Aircraft: Add the planes that will populate the Air corridor.

1. Click the Add Aircraft button. The Add Plane to Airport Dialog box appears.
2. Select a Country, Class and the Name of an aircraft from the designated drop-down lists in the dialog box.
3. Designate the number of aircraft to be available in this Air Corridor.
4. Click OK.

Delete Aircraft: Select an aircraft type from the Available Aircraft list, then click **DELETE AIRCRAFT** to remove that class of aircraft from the air corridor.

NOTE: The Plane Generation per Hr value on page one of the air corridor's Object Properties Panel determines how many planes are in the corridor at a time. When the total number of planes is exhausted, the air corridor becomes idle.

AIR STATION PROPERTIES

Air Stations can only be added to ships with embarked aircraft using the ship's Mission Object menu's Add Air Station option. Click an Air Station icon to bring up the Air Station Properties Panel pages.

PAGE ONE

Name: Create a name for the Air Station. Default is simply Air Station with a number appended as needed.

Assigned Aircraft 1: Select aircraft to be assigned to the station from the **Assigned Aircraft** drop-down list.

Aircraft 1 Loadout: Select the Mission Type. This determines the kind of weapons the aircraft carries in the mission.

Assigned Aircraft 2: Select aircraft to be assigned to the station from the Assigned Aircraft drop down list.

Aircraft 2 Loadout: Select the Mission Type. This determines the kind of weapons the aircraft carries in the mission.

NOTE: For a description of mission acronyms used in the Weapon Loadout drop-down list see *Appendix A: Glossary of Acronyms* on p. 198 and *Appendix B: Glossary of Terms* on p. 200.

Altitude: Set the altitude in feet for the aircraft at this station.

NOTE: An air station may contain one or two aircraft. Aircraft fly a predetermined pattern when on station.

AIRPLANE PROPERTIES

See Mission Editor/Object Properties Pane/Inflight Aircraft Properties on p. xxx. For information on selecting weapons loadouts for aircraft assigned to an air station, see Mission Editor/Object Properties Pane/Air Station Properties above..

AIRPORT PROPERTIES

The land-based airport building object has some properties in common with ships with embarked aircraft. In addition to the three Building Object Properties Panel pages, a forth page is available for airports.

PAGE ONE

Side: Select the object's side.

Name: Select the specific building object name.

Heading: Set the orientation of the building object. Enter a number 0 to 360 to designate the direction that the building faces.

Include in Sim: Specifies whether the selected airport is added to the mission as a simulation object.

Land-based simulation objects can be detected and marked by Ownship's periscope if Ownship is within 3 miles of the contact. If the land object emits radar it can also be detected and marked by ESM. Detected land simulation objects can be targeted with land attack missiles during gameplay. Buildings that are not simulation objects appear in the periscope (and in 3D if Show Truth is on) but can not be marked or destroyed in the mission.

Auto Detect: Specifies whether or not the building is always visible during a mission. When this option is selected the building appears on the Nav map automatically with an L designation and is not hidden when Link Data is off. (See *Main Menu/Options/Game/Show Link Data* on p. 29.)

Sub Command Tip: If you select Auto Detect for an object you must also select Include in Sim if you want to be able to destroy the object in the game.

PAGE TWO

Probability of Inclusion: This is the percentage chance an object appears at the start of the mission.

Latitude: Shows the starting latitude of the platform. Enter the desired latitude if a precise location is required.

Longitude: Shows the starting longitude of the platform. Enter the desired latitude if a precise location is required.

Alternatively you can click and drag the platform's icon to the desired latitude/longitude location and release the mouse button.

PAGE THREE

Grounded Aircraft Selected: Lists the aircraft that are available at this airport. Aircraft must be added before they will appear in the Grounded Aircraft list. Use the Add Aircraft button to add aircraft.

Add Aircraft: Click to bring up the Add Aircraft to Airport Dialog.

1. When the Add Plane to Airport Dialog box appears, select a Country, Class and the Name of an aircraft from the drop-down lists in the dialog box.
2. Designate the number of aircraft to be available at this airport.
3. Click **OK**. Repeat to add aircraft of different types.

Delete Aircraft: Select an aircraft type from the Grounded Aircraft Selected list, then click the Delete Aircraft button to remove that class of aircraft from the air corridor.

Add Inflight Aircraft: Click this button, then click the map to place aircraft aloft at the start of the game. The number of aircraft in the air is subtracted from the planes grounded at the airport. You must place planes at the airport before you can add inflight aircraft. You must then assign properties to these inflight aircraft by selecting the inflight aircraft's icon and designating properties on their Properties Panel. See *Mission Editor/Object Properties Pane/Inflight Aircraft Properties* on p. 183.

Add Corridor: Adding an air corridor from an airport works the same way as adding a regular air corridor except that one end of the air corridor is anchored at the airport. Click the white square at the outer end of the corridor to select it. See *Mission Editor/Object Properties Pane/Air Corridor Properties* on p. 179.

NOTE: The Plane Generation per Hr value on page one of the air corridor's Object Properties Panel determines how many planes are in the corridor at a time. When the total number of planes is exhausted, the air corridor becomes idle.

PAGE FOUR

This page contains the 3D model of the selected object.

Sub Command Tip: Use the 3D model to determine if the airport is at an appropriate altitude. If the airport appears to be floating or buried, adjust the location of the airport.

BUILDING PROPERTIES

Buildings (land-based objects) must be placed on land. There are three pages of properties for buildings.

PAGE ONE

Side: Select the object's side.

Name: Select the specific building object name.

Heading: Set the orientation of the building object. Enter a number 0 to 360 to designate the direction the building faces.

Include in Sim: Specifies whether the selected building is added to the mission as a simulation object.

Land-based simulation objects can be detected and marked by Ownship's periscope if Ownship is within 3 miles of the contact. If the land object emits radar it can also be detected and marked by ESM. Detected land simulation objects can be targeted with land attack missiles during gameplay. Buildings that are not simulation objects appear in the periscope (and in 3D if Show Truth is on) but can not be marked or destroyed in the mission.

Sub Command Tip: To add a building to your scenario for visual effect, without impacting gameplay, deselect the Include in Sim option. The selected building appears in the 3D view but is not included in the mission play (i.e. you can't mark or target it and it doesn't appear on the Nav map). Including too many buildings in the sim slows down the simulation and dramatically reduces frame rate.

Auto Detect: Specifies whether or not the building is always visible during a mission. When this option is selected the building appears on the Nav map automatically with an L designation and is not hidden when Show Link Data is off. (See Main Menu/Options/Game/Show Link Data on p. 29.)

Sub Command Tip: If you select Auto Detect for an object you must also select Include in Sim if you want to be able to destroy the object in the game.

PAGE TWO

Probability of Inclusion: This is the percentage chance an object appears at the start of the mission.

Latitude: Shows the starting latitude of the platform. Enter the desired latitude if a precise location is required.

Longitude: Shows the starting longitude of the platform. Enter the desired latitude if a precise location is required.

Alternatively you can click and drag the platform's icon to the desired latitude/longitude location and release the mouse button.

PAGE THREE

This page contains the 3D model of the selected object.

NOTE: Goal Properties Panel Pages are covered separately in Mission Editor/Goals on p. 189.

HELICOPTER PROPERTIES

See *Inflight Aircraft Properties* below.

INFLIGHT AIRCRAFT PROPERTIES

Inflight aircraft can be airplanes or helicopters. There are three pages of properties available for inflight aircraft. Click the inflight aircraft's icon to select its Object Properties Pane pages.

PAGE ONE

Name: Choose the type of aircraft to be placed.

Tactic: Choose the tactic the aircraft performs. For descriptions of these tactics, see *Appendix C: Tactics*, on p. 202.

NOTE: One tactic available to ASW aircraft that carry sonobuoys is a Sonobuoy Search tactic. Select Sonobuoy Search from the Tactic list then use the cursor to drag a box on the Mission map where the ASW helicopter or aircraft is to drop sonobuoys to search for submarines.

Speed: Set the aircraft's speed in knots.

Altitude: Set the aircraft's altitude in feet.

Weapon Loadout: Select Naval Warfare Mission Area assignment for the aircraft. Weapons appropriate for the mission type are loaded on the aircraft at mission start.

NOTE: For a description of mission acronyms used in the Weapon Loadout drop-down list see *Appendix A: Glossary of Acronyms* on p. 198 and *Appendix B: Glossary of Terms* on p. 200.

PAGE TWO

Probability of Inclusion: This is the percentage chance the object appears at the start of the mission.

Latitude: Shows the starting latitude of the platform. Enter the desired latitude if a precise location is required.

Longitude: Shows the starting longitude of the platform. Enter the desired latitude if a precise location is required.

Alternatively you can click and drag the platform's icon to the desired latitude/longitude location and release the mouse button.

PAGE THREE

Source Object: Displays the platform at which the aircraft is stationed.

Inflight Aircraft: Specify whether or not the aircraft is to begin the mission airborne.

Aircraft with Launch Time: When this option is selected the Launch Time box appears in which you set the time the aircraft launches from its source object. For example, if the mission begins at 08:00, setting the launch time to 08:15 makes the aircraft launch 15 minutes after the mission's start.

NOTE: If, after specifying aircraft with a specific launch time, you decide to change the scenario start time, your aircraft launch time is automatically updated to occur within the same elapsed time interval from the original scenario start time. For example, if the mission begins at 08:00 and the aircraft launch time is 08:15, changing the scenario start time to 06:00 causes the aircraft launch time to be updated to 06:15.

Refresh Station: Causes the aircraft's source object to automatically begin preparing another aircraft to take its place when that aircraft returns.

MINE PROPERTIES

When a mine is selected on the map, the following options for that mine appear on the Object Properties Panel.

PAGE ONE

Side: Assign the side to which the mine belongs.

Name: Specify the type of the selected mine. The mine type selected when the minefield was created is shown by default.

Depth: Specify the depth of the selected mine. The depth in feet designated when minefield was created is shown by default.

PAGE TWO

Probability of Inclusion: This is the percentage chance an object appears in the mission play.

Latitude: Adjust the latitude of the mine.

Longitude: Adjust the longitude of the mine.

SHIP PROPERTIES

There are three pages of object properties for most ships. Aircraft Carriers and ships with embarked helicopters with the have a fourth page shown below.

PAGE ONE

Side: Select the object's side. You can designate up to seven sides plus neutral. To set alliances between sides, see *Mission Editor/Editor Menu/Edit Menu/Side Alliances* on p. 170.

Country: Select the object's nation.

Class Designation: Select the object's class.

Name: Select the specific vessel name, or hull number for some classes.

Tactic: Choose the object's tactic from one of those listed. Click in the map and drag to place the tactic around the platform. To delete the current tactic just select a different tactic from the drop-down list. Descriptions of all tactics are described in *Appendix C: Tactics* on p. 202.

Speed: Enter the desired speed of the platform in knots.

Target Mode: Assign a special tactic for the object to follow when it encounters the platform selected in **Target Platform** drop-down.

None: No special tactic is assigned. The object uses the tactic assigned in the **Tactic** drop-down.

Attack: The object attacks the platform selected in Target Platform as soon the object detects the platform.

Track: The object tracks (trails) the platform selected in Target Platform as soon as the object detects the platform.

Target Platform: Lists all objects in the mission. The object applies the Target Mode set above to the platform selected in this drop-down.

PAGE TWO

Probability of Inclusion: This is the percentage chance the object appears at the start of the mission.

Latitude: Shows the starting latitude of the platform. Enter the desired latitude if a precise location is required.

Longitude: Shows the starting longitude of the platform. Enter the desired latitude if a precise location is required.

Alternatively you can click and drag the platform's icon to the desired latitude/longitude location and release the mouse button.

PAGE THREE

For ships with no embarked aircraft, page three displays the 3D object.

Carriers and Ships with Embarked Aircraft

If the selected object is an aircraft carrier or a smaller ship with embarked aircraft, the following fields are available on page three.

Aircraft Available: Shows the aircraft available on the selected ship or carrier.

Add Inflight Aircraft: Allows inflight aircraft to be placed in the mission.

- Click **ADD INFLIGHT AIRCRAFT** then click the map to place an aircraft icon. (You must select the aircraft icon and set its properties separately.

See *Mission Editor/Object Properties Panel/Inflight Aircraft Properties* on p. 183.

Add Air Station: Allows two planes to be placed at an air station.

- Click **ADD AIR STATION** then click the map to place the air station. Select the air station's icon to assign aircraft and set its properties.

See *Mission Editor/Object Properties Panel/Air Station Properties* on p. 179.

PAGE FOUR

Page four is only available for carriers and ships with embarked aircraft and displays the 3D model for the selected platform.

SUBMARINE PROPERTIES

When creating a mission, you must create at least one controllable sub. If there is no controllable submarine in a mission, the mission when selected does not open in the Mission Selection screen. Designate an appropriate sub as controllable on page two of a Submarine's Object Properties Panel. Properties that are only available when the object has been designated a Controllable Sub are noted in the description of the page where they occur.

To place a Controllable Sub in the Mission:

1. Select one of the following from page one:

Country: United States:

Class: Seawolf (SSN 21) or Los Angeles Class (SSN 688 I)

or

Country: Russia:

Class: Akula-I Improved (SSN) or Akula-II (SSN)

2. On page two click the Controllable Sub box to place a checkmark.
3. On page three select **Player Has Choice of Platform** to allow the player to select any sub in the **Specific Sub Selector** in the Mission Selection Screen when this controllable sub is selected in the **Controllable Sub Selector**. Leave this option unchecked if you want the player to be able to command only the sub named on page one of the sub's Object Properties Panel. (This option only appears if the sub has been designated controllable on page two.)
4. Place other controllable subs in the mission as desired and create individual tasking for each.

The number of controllable subs in a mission determines the number of players that can play that mission in Multiplayer mode. To make an eight-player multiplayer game, place eight controllable subs in the mission.

PAGE ONE

Side: Select the object's side. You can designate up to seven sides plus neutral.

Country: Select the object's nation.

Class Designation: Select the object's class.

Name: Select the specific vessel name, or hull number for some classes.

Tactic: Choose the object's tactic from the drop-down list. Tactics are listed and described in *Appendix C: Tactics* on p. 202. After the tactic is selected, the Description Bar prompts you to position the object tactic on the Mission map. Click in the map and drag to place the tactic around the platform. To delete the current tactic and place another, just select a different tactic from the drop-down list.

Speed: Enter the desired speed of the submarine at mission startup.

Depth: Enter the depth for the submarine at mission startup. If you enter a depth less than the submarine's surfaced depth, the game places that submarine on the surface at game start.

Target Mode: Assigns a special tactic for the object to follow when it encounters the platform selected in **Target Platform** drop-down.

None: No special tactic is assigned. The object uses the tactic assigned in the Tactic drop-down.

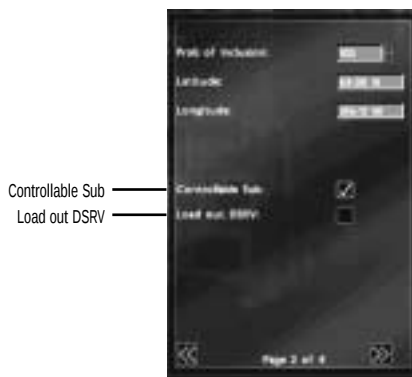
Attack: The object attacks the platform selected in Target Platform as soon the object detects the platform.

Track: The object tracks (trails) the platform selected in Target Platform as soon as the object detects the platform.

Target Platform: Lists all objects in the mission. The object applies the Target Mode set above to the platform selected in this drop-down.

NOTE: Any entries made in Tactics, Target Mode and Target Platform are disregarded if the sub is a controllable sub selected by a player. The player determines all tactics.

PAGE TWO



Probability of Inclusion: This is the percentage chance the object appears at the start of the mission. (If there is only one controllable sub in the mission, this should be set to 100. (Default is 100.)

Latitude: Shows the starting latitude of the platform. Enter the desired latitude if a precise location is required.

Longitude: Shows the starting longitude of the platform. Enter the desired latitude if a precise location is required.

Alternatively you can click and drag the platform's icon to the desired latitude/longitude location and release the mouse button.

Controllable Sub: This option is only available if the selected object has been designated one of these sub classes on page one: U.S. Seawolf, 688(I), an Improved or Russia: Akula-I Improved (SSN) or an Akula II (SSN).

- Click in the square following the label to select this submarine as a controllable platform. A check mark appears in the square when it is selected.

Sub Command Tip: Place up to eight controllable subs in a mission to make the mission a Multiplayer mission. The number of controllable subs placed in the mission determined the number of players that can play in a game. Each controllable sub can be given separate tasking.

Load out DSRV: This option only appears if the Controllable Sub option is selected. When selected, the Deep Submergence Rescue Vehicle (DSRV) is attached to the submarine at game start.

PAGE THREE

If the submarine is not designated a Controllable Sub, the 3D object displays on this page. If the submarine is designated a Controllable Sub the following options appear on page three.

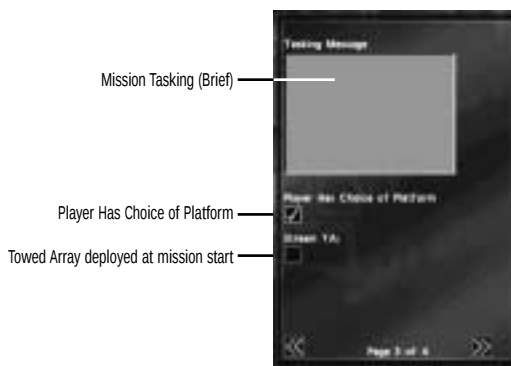
Tasking Message: Enter the text that appears in the Tasking Message on the Mission Selection Screen and in the Mission Brief. The text before a hard return displays in the Tasking window in Mission Selection. The entire message displays on the Mission Brief screen.

Player Has Choice of Platform: Selecting this option places ***Controllable Sub** in the Controllable Sub Selector on the Mission selection screen. The ***Controllable Sub** option gives the player the opportunity to select any sub (U.S. or Russian) listed in the Specific Sub Selector.

When this option is not selected, only the submarine named on page one is available to command in the Mission Selection screen for this Controllable Sub.

Sub Command Tip: Make sure that your tasking message is appropriate for any selectable sub regardless of country when using the Player Has Choice of Platform option.

Stream TA: When selected the sub's Towed Array is already deployed at mission start.



PAGE FOUR:

When the submarine has been designated as a Controllable Sub its 3D object displays on this page.

TEXT LABEL PROPERTIES

There is one page in the Text Label Properties Panel. There are two ways to place a text label.

- From the Mission Map menu select Chart Text Label then click the map.

or

- From the Editor menu select Add>Add Chart Text Label.

These options are available on the Properties Page for text labels.

Label: Displays a default text label with a sequential number appended. Click in the edit box and type in the desired text for the label.

Color: Select the desired color for the text label from the drop-down list. Eight colors are available.

WAYPOINT PROPERTIES

Each waypoint has one page of proprieties. Platforms can be assigned changes in speed and additional tactics to accomplish when the selected waypoint is reached.

The platform's estimated time of arrival at that waypoint displays at the top of the page.

Speed: Set the speed the platform should maintain after it reaches the selected waypoint.

Depth: Set the depth the submarine should maintain after it reaches this waypoint. (Available for submarine waypoints only.)

Altitude: Set the Altitude the platform should maintain after it reaches this waypoint. (Available for aircraft waypoints only.)

Tactic: Select an additional tactic for the platform to initiate when it reaches this waypoint. A description of tactics in this list is found in *Appendix C: Tactics* on p. 202.

Tactic Duration: Designate how long the platform should perform the new tactic before proceeding to the next waypoint.

Target Mode: Assigns a special tactic for the object to follow when it encounters the platform selected in **Target Platform** drop-down.

None: No special tactic is assigned. The object uses the tactic assigned in the Tactic drop-down.

Attack: The object attacks the platform selected in Target Platform as soon the object detects the platform.

Track: The object tracks (trails) the platform selected in Target Platform as soon as the object detects the platform.

Target Platform: Lists all objects in the mission. The object applies the Target Mode set above to the platform selected in this drop-down.

GOALS

Goals are the means by which you assign specific tasks to the player, provide him or her with intelligence information and trigger tasking messages during gameplay. Goals are also used to trigger events at a specific time in the mission. Ships other than those controlled by the player can also be assigned specific tasks that impact the player's experiences in the game. Because of the importance of goals in designing interesting and exciting scenarios, goals are covered separately in the section that follows.

There are two types of goals: Attached Goals and Global Goals. The two types and their sub-types are described below along with the Goal Object Properties Panel pages.

GLOBAL GOAL

A global goal is not attached to a specific object but you can designate specific criteria for goal accomplishment. There are two types of global goals, Destination and Automatic. Both types are described below.

To place a global goal:

1. Click the Goal button at the bottom of the screen.
2. Click the location on the map where the goal is to be placed. A goal icon can be moved to a different location by clicking on the goal icon and dragging it to a new location or by setting a specific longitude and latitude on page two of its Object Properties Panel pages.
3. Click the goal icon to select it. The Goal Object Properties Panel appears to the right of the map. See *Mission Editor/Goal Object Properties Panel Pages* on p. 191.

DESTINATION GOAL (GLOBAL)

A Global Destination Goal is achievable only when the object that matches the goal criteria arrives at the goal location on the map. The criteria are set on page one of the Global Goal's Object Properties Panel pages. A radius can be defined around the goal object so an object can trigger the goal by arriving at a position within that radius. The radius and specific longitude and latitude coordinates are set on page two of the Goal Object Properties Panel pages. You can also specify actions to occur when the destination goal is reached. See *Mission Editor/Goals/Goal Object Properties Panel Pages* on p. 191.

AUTOMATIC GOAL (GLOBAL)

An Automatic Goal has no specific criteria required for accomplishment. Automatic Goals are setup to trigger at a certain time in the scenario. No other criteria, such as side or country, need be specified for an object to trigger the goal. They are useful for providing intelligence, tasking, and other messages to the player at specific times during the mission. For specific information on setting properties for Goal objects see *Mission Editor/Goals/Goal Object Properties Panel Pages* on p. 191.

Sub Command Tip: Automatic goals are useful for sending "mission complete" messages to the player. In the Goal Precedence dialog for an Automatic Goal, specify that this goal cannot be triggered until all other goals in the mission are completed. Once all the other goals are completed, the "mission complete" goal is automatically triggered. (See *Mission Editor/Goals/Goal Precedence* on p. 194.)

ATTACHED GOALS

Attached Goals are created specifically for one object. More than one Attached Goal may be created for an individual object. Attached Goals provide a mechanism for identifying the method of the object's destruction, specifying what occurs when the object arrives at a designated location, and for the retrieving pilots and Special Forces.

To create an attached goal:

1. On the map, right-click the object to be assigned the goal. The Mission Object menu appears.
2. From the Mission Object menu select Add Attached Goal.
3. Click the map where the goal is to be placed. Click the goal icon to select it and bring up its Goal Object Properties Panel pages.
4. There are three different types of attached goals: Destination, Approach and Kill. These are available from the Goal Type drop-down list.

NOTE: Assigning points to Attached Goals causes these goal names to appear in the Mission Debrief screen when the player ends the mission.

DESTINATION GOAL (ATTACHED)

When an Attached Destination Goal is assigned, only the attached object can satisfy the goal. An Attached Destination Goal is triggered only when the attached object arrives at the goal location. A radius can be defined around the goal object so the attached object can trigger the goal by arriving at a position within that radius.

APPROACH GOAL (ATTACHED)

An attached Approach Goal is used to pick up a downed pilots and Special Forces or get within a specific radius of a ship or location.

For example, to make the pilot's rescue a mission goal a downed pilot icon must be placed on the map, an attached goal added to the pilot icon, and the ship or platform that is to rescue the pilot designated as described below.

To place a downed pilot:

1. Select the Ship Object button. Place the object by clicking on the Mission map at the desired location.
2. Click the ship icon to select it and, on the first Object Properties Panel page, Civilian for Country, Raft for Class Designation and Downed Pilot for Name.

3. The downed pilot must be assigned a tactic, however the specific type does not matter because speed is zero.

To add an Attached Approach Goal to a downed pilot:

1. Right-click the Downed Pilot icon to activate the Mission Object menu and select Add Attached Goal then click the map to place the attached goal.
2. Click the goal icon to select it and display the Goal Object Properties Panels. On page one select Approach Goal in the Type field. You must also specify the type of object that can pick up the pilot in the lower half of page one.
3. On page two of the properties panel designate a radius. The player must be within this radius for the goal to be achieved. Also set a maximum speed that must be met in order for the pick up to be complete.
4. For an object to actually be 'picked up' you must also select Remove Attached Object from the Action drop-down list on the last page of the Goal Object Properties Panels. When the approach goal criteria have been met, the object, in this case the downed pilot object, is removed from the map.

KILL GOAL (ATTACHED)

Kill goals are always attached to objects. The platform to which the goal is attached must be destroyed in order to satisfy this goal. On page one of the Object Properties Panel, you can specify characteristics for the platform that must accomplish this goal. Similar to the other goal types, you define the object by selecting the Side, Country, and Class properties. One additional option is the ability to specify the percentage of damage that must occur in order to satisfy the goal. If, for example, the player is required to cause 25% damage to a platform, add an attached Kill Goal to that platform and specify 25 for the damage. The remaining Object Properties Panel pages are the same as for *Destination Goal*, on p. 190.

GOAL OBJECT PROPERTIES PANEL PAGES

The pages of the Goal Object Properties are similar for most types of goals. Options that are only available for a specific type of goal are noted.

PAGE ONE

All goal types contain these first three option fields on Page one.

Goal apply to: Options in the list include ALL and any controllable sub in the mission. When a specific controllable sub is selected in this drop-down, this goal is only generated in the game if the player selects that sub to command.

Goal Name: Assign the goal a name. The default goal name is Goal with a sequential number appended. This goal name appears in the Mission Status Screen and in the Mission Debrief and Player's Log if points are attached to the goal.

Goal Type: Specify the goal type. Global Goal selections are Destination or Automatic goal. Attached Goal selections are Destination, Approach or Kill goal. Approach goals are used to pick up downed pilots of Special Forces team. See *Mission Editor/Goals/Attached Goals/Approach Goals* on p. 190.

Sub Command Tip: Specifying a Goal Name that indicates the purpose of the goal may make it easier to set goal precedence as well as aid you in remembering what the goal was created to accomplish.

ADDITIONAL PAGE ONE OPTIONS FOR SPECIFIC GOAL TYPES

Global Destination Goal, Attached Approach Goal and Attached Kill Goal have these additional options available on Page one.

Side: Assign the goal to a specific side. If you do not specify a side, the objects that can satisfy this goal do not have to belong to a specific side.

Country: Choose the nationality of the platform that must complete the goal. If you do not specify a country, the objects that can satisfy this goal do not have to belong to a specific country.

Class: Choose the class of the platform. If you do not select a class, the objects that can satisfy this goal do not have to belong to a specific class.

Name: If you specify a class, the Name field becomes available.

NOTE: For any goal you can specify the side, the country and the class of the object that must complete the goal. You may leave any of these fields blank, meaning that any value is valid for that field. For example, if you select "United States" for the country and leave the rest of the fields blank, any United States platform on any side can satisfy this goal. Similarly you can set the side specification to side 1, and leave the rest of the fields blank. Then any platform on side 1 can accomplish the goal.

PAGE TWO

The type of goal selected on page one determines which options are available on page two. All options that can appear on page two are shown here. Options that are not available for all types of goals are noted.

Max Speed: Set the Maximum speed allowable for goal completion. Set -1 to require no specific speed for goal completion. (Destination and Approach goals only)

Min Depth: Set the Minimum depth allowable for goal completion. Set -1 to require no specific depth for goal completion. (Destination and Approach goals only)

Max Depth: Set the Maximum depth allowable for goal completion. Set -1 to require no specific depth for goal completion. (Destination and Approach goals only)

Radius: Define a range around the goal. Arrival anywhere within this area accomplishes the goal. A white circle around the goal icon shows the range on the map. (Destination and Approach goals only.)

Damage: Designate the amount of damage that must occur for the goal to be achieved. If 50% damage must be inflicted to the designated object, place 50 in the damage field. (This option is available for Kill Goals only.)

Points: Assign a point value to the goal. The points are included in the mission's overall score and success rate. If a point value is assigned, the goal appears in the Assigned Tasks section of the Mission Debrief Screen. (Option available for all goal types.)

NOTE: Normally, assignment of points for Automatic Goals is not necessary, since these goals occur regardless of a player's actions.

Start/End Time: Specify the time within which the goal must be completed. If you do not select a start or end time, this goal can be accomplished at any time during the mission. (Option available for all goal types.) Time Format: Days:Hours:Min

Latitude: Displays the current latitude of the goal object. To adjust the latitude of the goal, type in a specific latitude coordinate. (Option not available for Automatic Goals.)

Longitude: Displays the current longitude of the goal object. To adjust the longitude of the goal, type in a specific longitude coordinate. (Option not available for Automatic Goals.)

Return to Base: Specify whether the platform must not only arrive within the radius of the goal but also return to base to satisfy the goal. This option is intended for aircraft objects. If a ship arrived within the goal's radius, it would automatically satisfy the goal. A check mark indicates the option is ON. Defaults to OFF. (Option not available for Automatic Goals.)

Critical Goal: Select if this goal must be completed for the mission to be considered successful. Defaults to OFF. (Option not available for Automatic Goals.)

PAGE THREE

Communications

Specify the parameters of the communications message the player receives when the goal is accomplished. During gameplay new communications messages are displayed in Report History window.

Type: Allows the user to specify one of two types of communications: The type of message selected determines which Task Bar History Window displays the message during gameplay.

Radio Message: A radio message provides further mission information or intelligence (During gameplay a Radio message appears in the Radio History Window in the Task Bar.)

Report: A report can be used to notify the player of game related information such as 'You have completed the goal.' (During gameplay a Report message appears in the Crew Report History window on the Task Bar.)

Text: Compose the text of the communications type designated in the Type drop-down above.

Audio File: Specify an audio file to be played when the message is displayed.

To play your own custom .wav file, copy the .wav file to the Scenario directory (a subdirectory off of the path in which *Sub Command* was installed) on your hard drive. Enter the name of this new .wav file in the goal Audio File box.

NOTE: When creating text or sound for the final goal of the game (i.e., the Mission Complete goal), make sure that the communication message tells the player that the mission has been completed. Missions have no other time limit or ending point.

NOTE: When designing multiplayer missions that have custom .wav files, participating players must have not only the scenario file but also the new .wav file(s). The other players should copy the .wav and scenario files to their Scenario directory.

PAGE FOUR

Goal Complete Message: Enter a message to be received at mission's end if the goal is achieved.

Goal Incomplete Messages: Enter a message to be received at mission's end if the goal is not achieved.

When the mission ends, the player reaches the Debrief screen where all the statistics of the mission are displayed. On this screen, all goals that have a non-zero point value are shown, along with their complete or incomplete status. If the goal was successfully completed, clicking on the goal name in the Debrief screen reveals the Goal Complete message for that goal. If the goal was not accomplished, clicking on the goal description displays the Goal Incomplete message for the goal.

NOTE: The Goal Complete and Goal Incomplete messages only appear in Debrief points are assigned to the goal. If a goal is assigned points but no Goal Complete or Incomplete message was created for the goal, the goal name in Debrief is not selectable.

PAGE FIVE

Action

Determine an action that takes place when the goal is reached. The following options appear in the Action Drop-down list.

NONE: No action takes place.

CREATE OBJECTS: When this option is selected the following buttons appear in the panel.

ADD GROUP: Click to display the Add Group Dialog. A Group must already exist. When this goal is triggered the group whose name is selected here is created.

DELETE GROUP: Select a group name in the Objects to Create list and click this button to delete the selected group from the creation list.

NOTE: It is important that any group that is created by a goal be given an inclusion probability of zero. This will ensure that this dynamic group will not be created when the scenario starts and will only be created when the goal is triggered.

Remove Attached Object

When using an Approach Goal to pick up pilots and Special Forces you must use this option to remove the pilot of Special Forces object from the map once the goal is triggered.

GOAL PRECEDENCE

In the Goal Precedence Dialog, you define the order in which you want your goals to be accomplished. If the goals are completed out of order, the player does not receive credit for completing them. For example: suppose you want to create a mission in which the player must navigate his sub to a specific point close to shore and then destroy a building with a Tomahawk strike. For stealth reasons, the player must arrive at a destination goal near the shore before completing the Attached Kill Goal on the land site. In the Goal Precedence dialog you should make the Destination Goal a child goal of the Kill Goal. This means that the Destination Goal must be accomplished *first*. The Kill Goal can only be completed after the Destination Goal is completed or no credit is given to the player for the kill.

To set Goal Precedence:

1. From the Editor menu, select Options>Goal Precedence. The Goal Precedence dialog box appears.
2. All goals in the mission are stored in the Root folder in the list to the left.
3. Click the + in front of the Root Folder to open it. A list of the goals appears.
4. To make a goal (G1) achievable only after another goal (G2) has been reached, click the second goal (G2) and drag it onto the first goal (G1), making (G2) a child of (G1). Now, (G1) cannot be accomplished unless (G2) is achieved first.

NOTE: The Goal Precedence dialog shows the goals in a reverse hierarchical tree. In other words, the child goals must be accomplished before the parent goals in order to maintain the correct order of completion.

Sub Command Tip: Use Goal Precedence to make a “mission complete” goal to inform the player when the mission is finished. To do this, create a “mission complete” Automatic Goal that has an Intel message notifying the player that the mission has ended. In the Goal Precedence dialog, make all other goals in the mission children of the “mission complete” goal. When all the goals in the mission are completed, “mission complete” goal is automatically triggered and informs the player the mission has ended.

DYNAMIC GROUPS

Dynamic Groups can make a mission appear random and dynamic so that each time you play the mission, the situation and gameplay are different. Missions can be designed so that only some of the Dynamic Groups are used in the scenario when the mission loads. Only those objects in the randomly selected Dynamic Groups appear in the mission. Therefore, when the mission starts, you may have different objects appear each time.

You can designate a certain number of objects from a selected Dynamic Group to appear in the mission. For example, suppose you want to create a mission in which the player's battlegroup is different every time he plays the game. To do this:

1. Create a Dynamic Group called, for example, USBattleGroup. Add a *Nimitz*, an *Arleigh Burke*, and a *Ticonderoga* to the USBattleGroup. Give each one of these platforms the desired probability of inclusion – the probabilities do not need to sum to 100%.
2. To ensure that at least one of the three ships appears in the mission, specify a Minimum of 1 ship in the settings for the USBattleGroup. To ensure that no more than two ships in the group appear in the mission, specify a Maximum of 2 in the settings for the USBattleGroup. At mission start, at least one ship and at most two are randomly chosen from the three.

You can also specify that an entire battlegroup be randomly selected when the mission starts. To do this, set up another Dynamic Group and call it, for example, RussianBattleGroup. This Dynamic Group is similar to the USBattleGroup only it contains Russian ships.

To set up the mission so that it randomly picks between the RussianBattleGroup and the USBattleGroup:

1. Create a parent group that contains both of these battlegroups. Create a group called ParentGroup and add the RussianBattleGroup and the USBattleGroup to it.
2. Now make the ParentGroup's probability of inclusion 100%, and set the Minimum to 1 and the Maximum to 1.
3. Change both the USBattleGroup's and the RussianBattleGroup's probability of inclusion to 50%. At mission start, either the RussianBattleGroup or the USBattleGroup is selected, each with an equal likelihood of occurrence.

Goals can also be members of Dynamic Groups, and appear in the mission only if the Dynamic Group is selected at mission start up. However, goals that are members of a Dynamic Group but are not attached to objects within the group are always created when the Dynamic Group is selected. The Minimum and Maximum specifications for the Dynamic Group do not affect these Goals. Conversely, goals that are attached to objects in the Dynamic Group are not created if the object itself is not created at mission start.

CREATE DYNAMIC GROUP

To create a dynamic group:

1. Click an object or group of objects by selecting Edit>Select Multiple Objects option from the Editor menu then dragging a box in the map to enclose the desired objects or by holding down the **[SHIFT]** key while clicking the desired objects.
2. From the Editor menu select Options>Create Dynamic Group. The Create Group dialog box appears.
3. Enter a name for the group in the Group Name field.
4. Set the probability that the group as a whole appears at the mission's start.

5. Determine how many individual ships within the Dynamic Group appear at the mission's start by using the Minimum and Maximum adjusters. To change the group's set up, select Options>Edit Dynamic Group from the Editor menu.

EDIT DYNAMIC GROUP

To edit a dynamic group:

1. From the Editor menu's Option menu, select Edit Dynamic Group. The Dynamic Groups dialog box appears.
2. On the left, a list of created dynamic groups appears. Click the folder of the group you wish to edit.
3. Adjust the group's probability of inclusion, as well as the range of ships that are generated within the group at the mission's start.
4. In the Selected Objects box, all the objects that make up the Dynamic Group are listed. The Available Objects box lists all objects available for selection. These are objects that are not included in this or any other Dynamic Group.
5. To add or delete an object from the Dynamic Group, click the name of the object you want to shift. Use the  and  buttons to move the chosen object into or out of the group.

You can use the Edit Dynamic Group function to randomly place a group on the Mission map at the mission's start.

1. Create a Dynamic Group in a position at which it can appear in the mission.
2. Select the entire group and create a duplicate using the Edit>Copy function in the Editor menu. Select Edit>Paste then click the map to paste the new group at a second location where it can randomly appear.
3. Select the new group which consists of the same ships as the first. Select Options>Create Dynamic Group. When the Create Group dialog box appears, give the second group a different name.
4. Select Edit Dynamic Group. The Dynamic Groups dialog box appears. Both groups' folders are displayed in the left-hand column.
5. Click **ADD GROUP** in the upper center of the box. Create a name for this new, empty group. A new folder appears.
6. Click this third group. Below, in the Available Objects box, the first two groups are listed. Move both groups into the Selected Objects box. They now become subgroups of the third.
7. For this third group, set Probability at 100%. Set both Minimum and Maximum settings to 1.
8. Now set each of the two subgroups' Probabilities to 50%. There are now two different locations in which the same group might appear at the start of the mission.

NOTE: Goals that are members of a Dynamic Group but are not attached to a specific object in the group are always created when the Dynamic Group is selected. The Minimum and maximum specifications for the Dynamic Group do not influence these goals. Conversely, goals that are attached to objects in the Dynamic Group are not created if the object itself is not created at mission start.



MISSION EDITOR HOTKEYS

These hotkeys are available in the Mission Editor

[TAB]	Navigates focus to the next closest visible object icon on the map.
[F1]	Navigates to the next waypoint of a tactic. If the currently selected icon is an object, this key selects the first waypoint in that object's tactic. If the selected icon is a waypoint, this key selects the next waypoint.
[F2]	Navigates to the previous waypoint of a tactic. Similar to the above key.
[ESC]	Cancels any operation in progress and brings up the Scenario Browser.
[DEL]	Deletes the currently selected object.
[A] + [I]	Displays USNI Information for the currently selected object.
[CONTROL] + [C]	Copy the currently selected object.
[CONTROL] + [V]	Paste from the copy buffer. Click the map to place the copied object.

STARTING A CREATED MISSION

By default created missions are treated as Single Missions.

To start a created mission:

1. Save a finished mission by selecting Mission>Save Mission in the Editor menu.
2. Click Mission>Exit to return to the Main menu.
3. Click Missions. Missions of the appropriate type appear in the Mission Selection List. Green stars to the left of the Mission Title differentiate user created missions from other mission types.
4. Click your mission's name, select a sub to command from the Submarine Selection List, then click OK to begin play. For Multiplayer games, see *Multiplayer* on p. 153.

NOTE: If you give the mission a name in the Editor menu's Options>Set Mission Name dialog that mission name appears in the Mission Selection list of the Mission's screen. If you do not set a name for the mission, the mission's filename appears in the Mission Selection list.

APPENDIX A: GLOSSARY OF ACRONYMS

AAW	Anti-air warfare
ADCAP	Advanced capability
AOB	Angle on the bow
ASUW	Antisurface warfare
ASW	Antisubmarine warfare, Antisubmarine weapon
Bk	Book
CM	Countermeasure
CO	Commanding officer
Comms	Communications
COMSUBLANT	Commander, U.S. Submarine Force, Atlantic
COW	Chief of the watch
CV	Carrier
CVBG	Carrier battle group
DEMON	Demodulated noise
DOOW	Diving officer of the watch
DR	Dead reckoning
DRT	Dead reckoning tracer
DSRV	Deep submersible rescue vehicle
EOT	Engine order telegraph
EP	Estimated position
ESM	Electronic warfare support measures
Fm	Fathom
FWA	Floating wire antenna
GPS	Global positioning system
HF	High frequency
Hz	Hertz
ID	Identification
intrlck	Interlock
IR	Infrared
Kts	Knots, or nautical miles per hour
Kyds	1000 yards
LLTV	Low Level Light television
LogReq	Logistics request
MAD	Magnetic anomaly detection
MBT	Main ballast tank
Mk	Mark

MSG	Message
MUC	Meritorious unit commendation
NATO	North Atlantic Treaty Organization
Nm	Nautical mile
NTDS	Naval Tactical Data System
NUC	Navy Unit Commendation
OOD	Officer of the deck
PD	Periscope depth
PUC	Presidential Unit Commendation
RAPLOC	Rapid localization
RBU	Rocket bomb unit
RECV	Receive
SAR	Search and rescue
SECNAV	Secretary of the Navy
SLOC	Sea lanes of communication
SLMM	Submarine-launched mobile mine
SOA	Speed of advance
SOF	Special Operations Forces
SNR	Signal-to-noise ratio
SS	Diesel-powered attack submarine
SSBN	Nuclear-powered ballistic missile submarine
SSN	Nuclear-powered attack submarine
SSP	Sound speed profile
TERCOM	Terrain counter matching
TLAM	Tomahawk land attack missile
TASM	Tomahawk Antiship Missile
TMA	Target motion analysis
TPK	Turns per knot
UGM	Guided missile (Underwater launched)
VLF	Very low frequency
VLS	Vertical launching system
XMIT	Transmit
yds	Yards

APPENDIX B: GLOSSARY OF TERMS

Angle on the Bow (AOB)	Aspect of ship referenced to a line between bow own ship and the contact, measured 0 to 180 degrees port or starboard.
Bow	Front of the ship.
Broadband	Acoustic signal consisting of a broad range of frequencies.
Cavitation	Bubbles created and collapsed at a propeller due to pressure changes; causes a large amount of noise.
Coordinate	Position of a point, often measured in latitude and longitude.
Countermeasure	Device used to interfere with a torpedo detecting its target or with a sonar that is tracking a contact.
Course	Direction of travel, measured 0 to 360 degrees from north.
Covert	Unknown to others; not openly shown.
Datum	Last known position.
Dead reckon (DR)	Approximation of ship position calculated using measured speed and heading.
Engine order telegraph (EOT)	Device used to send throttle (speed) orders to the engine room.
Fairwater	Structure on top of submarine used to protect masts and antennas.
Fathom (fm)	Measure of depth of water; 1fm = 6 ft = 1.8 m.
Fathometer	Active sonar device used to measure water depth.
Fix	Location of ship determined using external reference.
Flank	Maximum attainable speed.
Heading	Direction of travel, measured 0 to 360 degrees from north.
Helmsman	Operator responsible for steering and relaying speed orders.
Hydrophone	Electronic acoustic device used to receive sound.
Knots (kt)	Measure of speed in water; 1 kt = 1 nautical mile/hr = 1.14 miles/hr = 1.82 kilometers/hr.
Launch basket	The area from which to conduct an attack.
Leg	Period of time on a given course and speed.
Mark	Term describing the sending of bearings and/or range to a contact from a sensor to the TMA function.
Narrowband	Acoustic signal separated into narrow frequency windows.
Nautical mile (nm)	Measure of distance equal to 1 minute of latitude; 1nm = 2000 yards = 1.14 miles = 1.82 kilometers.
Planesman	Operator responsible for controlling the bow and stern planes of the submarine.
Port	Left side of ship as seen facing forward.
Signal-to-noise ratio (SNR)	Logarithmic ratio of signal to interfering noise used to measure acoustic noise interference.

Snapshot	Quick reaction torpedo firing procedure.
Snorkeling	Submarine term for operating the diesel generator while submerged at periscope depth.
Snorting	British term for snorkeling.
Sonobuoy	Small acoustic device that uses passive or active sonar; usually deployed from aircraft.
Sounding	Measurement of depth; "The sounding is 15 fathoms"; can refer to the process or the result.
Stadimeter	Device used to measure distance to an object visually given the height of the object.
Starboard	Right side of ship as seen facing forward.
Stern	Back of ship.
Strike	Attacks against land targets.
Tracker	Device used to automatically follow a sonar signal and send information to the TMA function.
Transducer	Electronic acoustic device used to transmit and receive sound.
Waypoint	Intermediate point used to define an overall path.
Weapons free	Weapons can be employed against threat contacts without further permission being required.
XBT	Device used to measure the sound speed profile, fired from a submarine similarly to a countermeasure.

APPENDIX C: TACTICS

Tactics that can be assigned to platforms and waypoints in the Mission Editor are shown below.

Area Waypoint	Similar to transit search in that the platform travels to each of the four waypoints and searches for enemy contacts. The waypoints may be dragged to any position on the map. Unlike transit search, when the platform reaches the last waypoint, it returns to the first waypoint and resumes the pattern.
Barrier	The platform travels back and forth along an assigned path. The waypoint marker that appears on the map can be moved to any position.
Expanding Box	The platform first patrols the area in an outward spiral pattern then an inward spiral pattern.
Ladder Box	The platform patrols the area in a back-and-forth pattern within the parameters of the box.
Perimeter Box	The platform patrols the area along the perimeter of the box.
Random Box	The platform patrols the area in a random pattern.
Sonobuoy Search	(Only available to aircraft carrying sonobuoys) Click and drag in the Mission Editor map to place a search area for the aircraft to follow during gameplay.
Transit Search	The platform travels to each of the four waypoints and searches for enemy contacts. If an enemy is detected, it deviates from its path to engage. The waypoints may be dragged to any position on the map. At the last waypoint, the platform maintains the assigned course and speed indefinitely unless it detects a threat.
Transit	The platform travels to each waypoint. It does not deviate from its path except in defense. Four waypoints appear which can be dragged to any position on the map. At the last waypoint, the platform maintains the assigned course and speed indefinitely.

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